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(54) COMMUNICATION EQUIPMENT AND METHOD THEREFOR, COMMUNICATION SYSTEM, RECORDING MEDIUM AND PROGRAM

(57)Abstract:
PROBLEM TO BE SOLVED: To cipher images.
SOLUTION: In a diagram 135, the image for which the image of an object in a black round shape is picked up is indicated in the utmost left column top row of a matrix. From the state, for instance, at the time of adding a movement blur in the vertical direction, the object in the black round shape becomes the image in which the movement blur is generated in the vertical direction as indicated in the center column

top row. Further, at the time of generating the movement blur in the horizontal direction, it becomes the image in which the movement blur is generated in the vertical and horizontal directions of the object as indicated in the center column center row. By repeating similar processings, the possibility of deciphering the object is lowered and thus, the image itself can be ciphered.

CLAIMS

[Claim(s)]
[Claim 1]A communication apparatus comprising:
A demand information input means which inputs a user's demand information.
A foreground ingredient picture which consists of a foreground object ingredient which constitutes a foreground object of image data which consists of a pixel value determined according to quantity of light which constitutes a picture with which it integrated in time for every pixel according to said demand information.
A synthesizing means which compounds a background component image which consists of a background object component which constitutes background objects of said image data, and generates image composing.
An image composing output means which outputs image composing generated by said synthesizing means.

[Claim 2]The communication apparatus according to claim 1, wherein said image composing output means outputs said image composing to said user's communication apparatus.
[Claim 3]Said demand information input means with a user's demand information Said predetermined foreground ingredient picture, Input significant information used when compounding said predetermined background component image, and said predetermined foreground ingredient picture and said predetermined background

component image, and said synthesizing means, The communication apparatus according to claim 1 compounding a foreground ingredient picture predetermined [said] inputted with said demand information by said demand information input means, and said predetermined background component image based on said significant information, and generating image composing.

[Claim 4]Said demand information input means as significant information used when compounding said predetermined foreground ingredient picture, said predetermined background component image, and said predetermined foreground ingredient picture and said predetermined background component image with a user's demand information, Input the mixture ratio of a mixing zone of said predetermined foreground ingredient picture and said predetermined background component image, and said synthesizing means, The communication apparatus according to claim 3 compounding a foreground ingredient picture predetermined [said] inputted with said demand information by said demand information input means, and said predetermined background component image based on said mixture ratio as said significant information, and generating image composing.

[Claim 5]Said demand information input means as significant information used when compounding said predetermined foreground ingredient picture, said predetermined background component image, and said predetermined foreground ingredient picture and said predetermined background component image with a user's demand information, Input movement quantity and the motion direction of said foreground ingredient picture, and said synthesizing means, Based on said movement quantity and said motion direction of as said significant information, move said predetermined foreground ingredient picture inputted with said demand information by said demand information input means, and a Japanese quince is adjusted, The communication apparatus according to claim 3 compounding with said predetermined background component image, and generating image composing.

[Claim 6]Said demand information input means as significant information used when compounding said predetermined foreground ingredient picture, said predetermined background component image, and said predetermined foreground ingredient picture and said predetermined background component image with a user's demand information, Input initial position information, movement quantity, and the motion direction of said foreground ingredient picture, and said synthesizing means, Based on said movement quantity and said motion direction of as said significant information, move said predetermined foreground ingredient picture inputted with said demand information by said demand information input means, adjust a Japanese quince, and said mixture ratio is computed, A foreground ingredient picture predetermined [said] with which motion dotage was adjusted, and said predetermined background component image with said computed mixture ratio. The communication apparatus according to claim 3 compounding based on initial position information, said movement

quantity, and said motion direction of said foreground ingredient picture of as significant information, and generating image composing.

[Claim 7]A foreground ingredient image identifier from which said demand information input means discriminates said predetermined foreground ingredient picture with a user's demand information, Input a background component image identifier which identifies said predetermined background component image, and said significant information, and said synthesizing means, A foreground ingredient picture corresponding to said foreground ingredient image identifier according to a foreground ingredient image identifier which identifies said predetermined foreground ingredient picture with said demand information, a background component image identifier which identifies said predetermined background component image, and said significant information, The communication apparatus according to claim 1 compounding a background component image corresponding to said background component image identifier based on said significant information, and generating image composing.

[Claim 8]The communication apparatus according to claim 1 having further a charging means which performs accounting according to said demand information.

[Claim 9]According to said demand information, said charging means Said user's identifier, an identifier of said communication apparatus, And the communication apparatus according to claim 8 generating accounting information including amount information corresponding to said demand information, and performing accounting to said user's financial account based on said accounting information.

[Claim 10]Have further a point storage means which memorizes a point equivalent to cash for every user used for said accounting, and said charging means, According to said demand information, said user's identifier, an identifier of said communication apparatus, And the communication apparatus according to claim 8 performing accounting when only a part corresponding to said amount information subtracts a point size which generated accounting information including amount information corresponding to said image composing, and was memorized by said point storage means.

[Claim 11]The communication apparatus according to claim 8 after said output means is completed [accounting] by said charging means, wherein it outputs said image composing to said user's communication apparatus which accounting completed.

[Claim 12]A correspondence procedure comprising:

A demand information inputting step which inputs a user's demand information.

A foreground ingredient picture which consists of a foreground object ingredient which constitutes a foreground object of image data which consists of a pixel value determined according to quantity of light which constitutes a picture with which it integrated in time for every pixel according to said demand information.

A synthetic step which compounds a background component image which consists of a background object component which constitutes background objects of said image

data, and generates image composing.
An image composing output step which outputs image composing generated by processing of said synthetic step.

[Claim 13]A recording medium with which a program which a computer can read is recorded, comprising:
A demand information inputting control step which controls an input of a user's demand information.
A foreground ingredient picture which consists of a foreground object ingredient which constitutes a foreground object of image data which consists of a pixel value determined according to quantity of light which constitutes a picture with which it integrated in time for every pixel according to said demand information.
Composition of a background component image which consists of a background object component which constitutes background objects of said image data.
A synthetic control step which controls generation of image composing, and an image composing output-control step which controls said output of image composing by which synthetic control step generation was carried out.

[Claim 14]According to a demand information inputting control step which controls an input of a user's demand information, and said demand information, A foreground ingredient picture which consists of a foreground object ingredient which constitutes a foreground object of image data which consists of a pixel value determined according to quantity of light which constitutes a picture with which it integrated in time for every pixel, Composition of a background component image which consists of a background object component which constitutes background objects of said image data, A program which makes a computer perform a synthetic control step which controls generation of image composing, and an image composing output-control step which controls said output of image composing by which synthetic control step generation was carried out.
[Claim 15]A communications system which consists of the 1st communication apparatus and 2nd communication apparatus, comprising:
A demand information input means as which said 1st communication apparatus inputs a user's demand information.
A demand information transmission means which transmits demand information inputted by said demand information input means to said 2nd communication apparatus.
A demand information receiving means which receives said demand information which is equipped with an image composing reception means which receives image composing transmitted from said 2nd communication apparatus according to said demand information, and to which said 2nd communication apparatus is transmitted

from said 1st communication apparatus.
A foreground ingredient picture which consists of a foreground object ingredient which constitutes a foreground object of image data which consists of a pixel value determined according to quantity of light which constitutes a picture with which it integrated in time for every pixel according to said demand information.
A synthesizing means which compounds a background component image which consists of a background object component which constitutes background objects of said image data, and generates said image composing.
An image composing transmitting means which transmits said image composing generated by said synthesizing means to said 1st communication apparatus.

[Claim 16]Said demand information input means with a user's demand information Said predetermined foreground ingredient picture, Input significant information used when compounding said predetermined background component image, and said predetermined foreground ingredient picture and said predetermined background component image, and said synthesizing means, The communication apparatus according to claim 15 compounding a foreground ingredient picture predetermined [said] inputted with said demand information by said demand information input means, and said predetermined background component image based on said significant information, and generating image composing.
[Claim 17]Said demand information input means as significant information used when compounding said predetermined foreground ingredient picture, said predetermined background component image, and said predetermined foreground ingredient picture and said predetermined background component image with a user's demand information, Input the mixture ratio of a mixing zone of said predetermined foreground ingredient picture and said predetermined background component image, and said synthesizing means, The communication apparatus according to claim 16 compounding a foreground ingredient picture predetermined [said] inputted with said demand information by said demand information input means, and said predetermined background component image based on said mixture ratio as said significant information, and generating image composing.
[Claim 18]Said demand information input means as significant information used when compounding said predetermined foreground ingredient picture, said predetermined background component image, and said predetermined foreground ingredient picture and said predetermined background component image with a user's demand information, Input movement quantity and the motion direction of said foreground ingredient picture, and said synthesizing means, Based on said movement quantity and said motion direction of as said significant information, move said predetermined foreground ingredient picture inputted with said demand information by said demand information input means, and a Japanese quince is adjusted, The communication

apparatus according to claim 16 compounding with said foreground ingredient picture and generating image composing.

[Claim 19]Said demand information input means as significant information used when compounding said predetermined foreground ingredient picture, said predetermined background component image, and said predetermined foreground ingredient picture and said predetermined background component image with a user's demand information, Input initial position information, movement quantity, and the motion direction of said foreground ingredient picture, and said synthesizing means, Based on said movement quantity and said motion direction of as said significant information, move said predetermined foreground ingredient picture inputted with said demand information by said demand information input means, adjust a Japanese quince, and said mixture ratio is computed, A foreground ingredient picture predetermined [said] with which motion dotage was adjusted, and said predetermined background component image with said computed mixture ratio. The communication apparatus according to claim 16 compounding based on initial position information, said movement quantity, and said motion direction of said foreground ingredient picture of as significant information, and generating image composing.

[Claim 20]A foreground ingredient image identifier from which said demand information input means discriminates said predetermined foreground ingredient picture with a user's demand information, Input a background component image identifier which identifies said predetermined background component image, and said significant information, and said synthesizing means, A foreground ingredient picture corresponding to said foreground ingredient image identifier according to a foreground ingredient image identifier which identifies said predetermined foreground ingredient picture with said demand information, a background component image identifier which identifies said predetermined background component image, and said significant information, The communication apparatus according to claim 16 compounding a background component image corresponding to said background component image identifier based on said significant information, and generating image composing.

[Claim 21]The communication apparatus according to claim 15 having further a charging means which performs accounting according to said demand information.

[Claim 22]According to said demand information, said charging means Said user's identifier, an identifier of said communication apparatus, And the communication apparatus according to claim 21 generating accounting information including amount information corresponding to said demand information, and performing accounting to said user's financial account based on said accounting information.

[Claim 23]Have further a point storage means which memorizes a point for every user used for said accounting, and said charging means, According to said demand information, said user's identifier, an identifier of said communication apparatus, And the communication apparatus according to claim 21 performing accounting when only

a part corresponding to said amount information subtracts a point size which generated accounting information including amount information corresponding to said image composing, and was memorized by said point storage means.

[Claim 24]The communication apparatus according to claim 21 after said output means is completed [accounting] by said charging means, wherein it outputs said image composing to said user's communication apparatus which accounting completed.

[Claim 25]A correspondence procedure of a communications system which consists of the 1st communication apparatus and 2nd communication apparatus characterized by comprising the following.

A demand information inputting step into which a correspondence procedure of said 1st communication apparatus inputs a user's demand information.

A demand transmitting information step which transmits demand information inputted by processing of said demand information inputting step to said 2nd communication apparatus.

A demand information reception step which receives said demand information to which a correspondence procedure of said 2nd communication apparatus is transmitted from said 1st communication apparatus including an image composing receiving step which receives image composing transmitted from said 2nd communication apparatus according to said demand information.

A foreground ingredient picture which consists of a foreground object ingredient which constitutes a foreground object of image data which consists of a pixel value determined according to quantity of light which constitutes a picture with which it integrated in time for every pixel according to said demand information.

A synthetic step which compounds a background component image which consists of a background object component which constitutes background objects of said image data, and generates image composing.

An image composing transmission step which transmits image composing generated by processing of said synthetic step to said 1st communication apparatus.

[Claim 26]A program which controls a communications system which consists of the 1st communication apparatus and 2nd communication apparatus, comprising:

A demand information inputting control step by which a program which controls said 1st communication apparatus controls an input of a user's demand information.

A demand transmitting information control step which controls transmission to said 2nd communication apparatus of demand information inputted by processing of said demand information inputting control step.

A demand information reception control step which controls reception of said demand information to which a program which controls said 2nd communication apparatus is transmitted from said 1st communication apparatus including an image composing

reception-control step which controls reception of image composing transmitted from said 2nd communication apparatus according to said demand information.
A foreground ingredient picture which consists of a foreground object ingredient which constitutes a foreground object of image data which consists of a pixel value determined according to quantity of light which constitutes a picture with which it integrated in time for every pixel according to said demand information, A synthetic control step which controls composition of a background component image which consists of a background object component which constitutes background objects of said image data, and generation of image composing, and an image composing transmission-control step which controls transmission to said 1st communication apparatus of image composing generated by processing of said synthetic control step.

[Claim 27]A demand information inputting control step which controls an input of a user's demand information to a computer which controls said 1st communication apparatus among computers which control a communications system which consists of the 1st communication apparatus and 2nd communication apparatus, A demand transmitting information control step which controls transmission to said 2nd communication apparatus of demand information inputted by processing of said demand information inputting control step, According to said demand information, an image composing reception-control step which controls reception of image composing transmitted from said 2nd communication apparatus is performed, A demand information reception control step which controls reception of said demand information transmitted to a computer which controls said 2nd communication apparatus from said 1st communication apparatus, A foreground ingredient picture which consists of a foreground object ingredient which constitutes a foreground object of image data which consists of a pixel value determined according to quantity of light which constitutes a picture with which it integrated in time for every pixel according to said demand information, Image composing generated by processing of a synthetic control step which controls composition of a background component image which consists of a background object component which constitutes background objects of said image data, and generation of image composing, and said synthetic control step, A program which performs an image composing transmission-control step which controls transmission to said 1st communication apparatus.
[Claim 28]A communication apparatus comprising:
A demand information input means which inputs a user's demand information.
A demand information transmission means which transmits demand information inputted by said demand information input means to other communication apparatus.
An image composing reception means which receives image composing transmitted from a communication apparatus besides the above according to said demand information.

[Claim 29]A correspondence procedure comprising:
A demand information inputting step which inputs a user's demand information.
A demand transmitting information step which transmits demand information inputted by processing of said demand information inputting step to other communication apparatus.
An image composing receiving step which receives image composing transmitted from a communication apparatus besides the above according to said demand information.

[Claim 30]A recording medium with which a program which a computer can read is recorded, comprising:
A demand information inputting control step which controls an input of a user's demand information.
A demand transmitting information control step which controls transmission to other communication apparatus of demand information inputted by processing of said demand information inputting control step.
An image composing reception-control step which controls reception of image composing transmitted from a communication apparatus besides the above according to said demand information.

[Claim 31]A demand transmitting information control step which controls transmission to other communication apparatus of demand information inputted by processing of a demand information inputting control step which controls an input of a user's demand information, and said demand information inputting control step, A program which performs an image composing reception-control step which controls reception of image composing transmitted from a communication apparatus besides the above according to said demand information.
[Claim 32]A communication apparatus comprising:
A demand information receiving means which receives said demand information transmitted from other communication apparatus.
A foreground ingredient picture which consists of a foreground object ingredient which constitutes a foreground object of image data which consists of a pixel value determined according to quantity of light which constitutes a picture with which it integrated in time for every pixel according to said demand information.
A synthesizing means which compounds a background component image which consists of a background object component which constitutes background objects of said image data, and generates said image composing.
An image composing transmitting means which transmits said image composing generated by said synthesizing means to a communication apparatus besides the above.

[Claim 33]A correspondence procedure comprising:
A demand information reception step which receives said demand information transmitted from other communication apparatus.
A foreground ingredient picture which consists of a foreground object ingredient which constitutes a foreground object of image data which consists of a pixel value determined according to quantity of light which constitutes a picture with which it integrated in time for every pixel according to said demand information.
A synthetic step which compounds a background component image which consists of a background object component which constitutes background objects of said image data, and generates said image composing.
An image composing transmission step which transmits said image composing generated by processing of said synthetic step to a communication apparatus besides the above.

[Claim 34]A recording medium with which a program which a computer can read is recorded, comprising:
A demand information reception control step which controls reception of said demand information transmitted from other communication apparatus.
A foreground ingredient picture which consists of a foreground object ingredient which constitutes a foreground object of image data which consists of a pixel value determined according to quantity of light which constitutes a picture with which it integrated in time for every pixel according to said demand information.
A synthetic control step which compounds a background component image which consists of a background object component which constitutes background objects of said image data, and controls generation of said image composing.
An image composing transmission-control step which controls transmission to a communication apparatus besides the above of said image composing generated by processing of said synthetic control step.

[Claim 35]A demand information reception control step which controls reception of said demand information transmitted from other communication apparatus, A foreground ingredient picture which consists of a foreground object ingredient which constitutes a foreground object of image data which consists of a pixel value determined according to quantity of light which constitutes a picture with which it integrated in time for every pixel according to said demand information, A synthetic control step which compounds a background component image which consists of a background object component which constitutes background objects of said image data, and controls generation of said image composing, A program which performs an image composing transmission-control step which controls transmission to a

communication apparatus besides the above of said image composing generated by processing of said synthetic control step.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention]This invention relates to the communication apparatus and the method, the communications system, recording medium, and program in consideration of the difference from the signal and the real world which were detected by the sensor about a communication apparatus and a method, a communications system, a recording medium, and a program.

[0002]

[Description of the Prior Art]A sensor detects the phenomenon in the real world and the art of processing the sampling data which an image sensor outputs is used widely.

[0003]For example, when objective movement speed is comparatively quick, it will move to the picture acquired by picturizing the object which moves in front of the predetermined background of standing it still with a video camera, and a Japanese quince will arise in it.

[0004]The method of embedding so that it cannot recognize being enciphered by the flat part as art which enciphers the above pictures, and the method of embedding information using the correlativity of a picture are proposed.

[0005]

[Problem(s) to be Solved by the Invention]When an object moves in front of a stationary background, mixing with the picture of the object which moves with the picture of not only a Japanese quince but a background by moving by mixing of the picture of the object which moves itself arises. Conventionally, the processing corresponding to the state of mixing with the picture of a background and the picture of the object which moves was not considered.

[0006]This invention is made in view of such a situation, and enables it to make a picture encipher using the state of mixing of a picture.

[0007]

[Means for Solving the Problem]This invention is characterized by the 1st communication apparatus comprising the following.

A demand information input means which inputs a user's demand information.

A foreground ingredient picture which consists of a foreground object ingredient which constitutes a foreground object of image data which consists of a pixel value determined according to quantity of light which constitutes a picture with which it

integrated in time for every pixel according to demand information.
A synthesizing means which compounds a background component image which consists of a background object component which constitutes background objects of image data, and generates image composing.
An image composing output means which outputs image composing generated by synthesizing means.

[0008]A user's communication apparatus can be made to output image composing to said image composing output means.
[0009]In said demand information input means, with a user's demand information, a predetermined foreground ingredient picture, Make significant information used when compounding a predetermined background component image, and a predetermined foreground ingredient picture and a predetermined background component image input, and to a synthesizing means. A predetermined foreground ingredient picture inputted with demand information by a demand information input means and a predetermined background component image are made to compound based on significant information, and image composing can be made to generate.
[0010]As significant information used for it when compounding a predetermined foreground ingredient picture, a predetermined background component image, and a predetermined foreground ingredient picture and a predetermined background component image in said demand information input means with a user's demand information, Make the mixture ratio of a mixing zone of a predetermined foreground ingredient picture and a predetermined background component image input, and to a synthesizing means. A predetermined foreground ingredient picture inputted with demand information by a demand information input means and a predetermined background component image are made to compound based on the mixture ratio as significant information, and image composing can be made to generate.
[0011]As significant information used for it when compounding a predetermined foreground ingredient picture, a predetermined background component image, and a predetermined foreground ingredient picture and a predetermined background component image in said demand information input means with a user's demand information, Make movement quantity and the motion direction of a foreground ingredient picture input, and to a synthesizing means. A predetermined foreground ingredient picture inputted with demand information by a demand information input means can be moved based on movement quantity and the motion direction of as significant information, a Japanese quince can be adjusted, it can be made to be able to compound with a predetermined background component image, and image composing can be made to generate.
[0012]As significant information used for it when compounding a predetermined foreground ingredient picture, a predetermined background component image, and a

predetermined foreground ingredient picture and a predetermined background component image in said demand information input means with a user's demand information, Make initial position information, movement quantity, and the motion direction of a foreground ingredient picture input, and to a synthesizing means. Based on movement quantity and the motion direction of as significant information, move a predetermined foreground ingredient picture inputted with demand information by a demand information input means, adjust a Japanese quince, and the mixture ratio is computed, A predetermined foreground ingredient picture to which motion dotage was adjusted, and a predetermined background component image can be made to be able to compound with the computed mixture ratio based on initial position information, movement quantity, and the motion direction of a foreground ingredient picture of as significant information, and image composing can be made to generate.

[0013]A foreground ingredient image identifier which identifies a predetermined foreground ingredient picture with a user's demand information in said demand information input means, Make a background component image identifier which identifies a predetermined background component image, and significant information input, and to a synthesizing means. A foreground ingredient picture corresponding to a foreground ingredient image identifier according to a foreground ingredient image identifier which identifies a predetermined foreground ingredient picture with demand information, a background component image identifier which identifies a predetermined background component image, and significant information, A background component image corresponding to a background component image identifier is made to compound based on significant information, and image composing can be made to generate.

[0014]A charging means which performs accounting can be made to establish further according to said demand information.

[0015]Accounting information which includes a user's identifier, an identifier of a communication apparatus, and amount information corresponding to demand information according to demand information is generated in said charging means, and it can be made to perform accounting to a user's financial account based on accounting information.

[0016]Can make a point storage means which memorizes a point equivalent to cash for every user used for said accounting establish further, and to a charging means. Accounting information which includes a user's identifier, an identifier of a communication apparatus, and amount information corresponding to image composing according to demand information is generated, and accounting can be performed when only a part corresponding to amount information subtracts a point size memorized by point storage means.

[0017]After accounting is completed by a charging means, a user's communication apparatus which accounting completed can be made to output image composing to

said output means.

[0018]This invention is characterized by the 1st correspondence procedure comprising the following.

A demand information inputting step which inputs a user's demand information.

A foreground ingredient picture which consists of a foreground object ingredient which constitutes a foreground object of image data which consists of a pixel value determined according to quantity of light which constitutes a picture with which it integrated in time for every pixel according to demand information.

A synthetic step which compounds a background component image which consists of a background object component which constitutes background objects of image data, and generates image composing.

An image composing output step which outputs image composing generated by processing of a synthetic step.

[0019]This invention is characterized by a program of the 1st recording medium comprising the following.

A demand information inputting control step which controls an input of a user's demand information.

A foreground ingredient picture which consists of a foreground object ingredient which constitutes a foreground object of image data which consists of a pixel value determined according to quantity of light which constitutes a picture with which it integrated in time for every pixel according to demand information.

Composition of a background component image which consists of a background object component which constitutes background objects of image data.

A synthetic control step which controls generation of image composing, and an image composing output-control step which controls an output of image composing by which synthetic control step generation was carried out.

[0020]A demand information inputting control step by which the 1st program of this invention controls an input of a user's demand information, A foreground ingredient picture which consists of a foreground object ingredient which constitutes a foreground object of image data which consists of a pixel value determined according to quantity of light which constitutes a picture with which it integrated in time for every pixel according to demand information, Composition of a background component image which consists of a background object component which constitutes background objects of image data, A computer is made to perform a synthetic control step which controls generation of image composing, and an image composing output-control step which controls an output of image composing by which synthetic control step generation was carried out.

[0021]This invention is characterized by a communications system comprising the

following.
A demand information input means as which the 1st communication apparatus inputs a user's demand information.
A demand information transmission means which transmits demand information inputted by a demand information input means to the 2nd communication apparatus.
A demand information receiving means which receives demand information which is equipped with an image composing reception means which receives image composing transmitted from the 2nd communication apparatus according to demand information, and to which the 2nd communication apparatus is transmitted from the 1st communication apparatus.
A foreground ingredient picture which consists of a foreground object ingredient which constitutes a foreground object of image data which consists of a pixel value determined according to quantity of light which constitutes a picture with which it integrated in time for every pixel according to demand information, A synthesizing means which compounds a background component image which consists of a background object component which constitutes background objects of image data, and generates image composing, and an image composing transmitting means which transmits image composing generated by synthesizing means to the 1st communication apparatus.

[0022]In said demand information input means, with a user's demand information, a predetermined foreground ingredient picture, Make significant information used when compounding a predetermined background component image, and a predetermined foreground ingredient picture and a predetermined background component image input, and to a synthesizing means. A predetermined foreground ingredient picture inputted with demand information by a demand information input means and a predetermined background component image are made to compound based on significant information, and image composing can be made to generate.
[0023]As significant information used for it when compounding a predetermined foreground ingredient picture, a predetermined background component image, and a predetermined foreground ingredient picture and a predetermined background component image in said demand information input means with a user's demand information, Make the mixture ratio of a mixing zone of a predetermined foreground ingredient picture and a predetermined background component image input, and to a synthesizing means. A predetermined foreground ingredient picture inputted with demand information by a demand information input means and a predetermined background component image are made to compound based on the mixture ratio as significant information, and image composing can be made to generate.
[0024]As significant information used for it when compounding a predetermined foreground ingredient picture, a predetermined background component image, and a

predetermined foreground ingredient picture and a predetermined background component image in said demand information input means with a user's demand information, Make movement quantity and the motion direction of a foreground ingredient picture input, and to a synthesizing means. Based on movement quantity and the motion direction of as significant information, move a predetermined foreground ingredient picture inputted with demand information by a demand information input means, adjust a Japanese quince, it is made to compound with a foreground ingredient picture, and image composing can be made to generate.

[0025]As significant information used for it when compounding a predetermined foreground ingredient picture, a predetermined background component image, and a predetermined foreground ingredient picture and a predetermined background component image in said demand information input means with a user's demand information, Make initial position information, movement quantity, and the motion direction of a foreground ingredient picture input, and a synthesizing means, Based on movement quantity and the motion direction of as significant information, move a predetermined foreground ingredient picture inputted with demand information by a demand information input means, adjust a Japanese quince, and the mixture ratio is computed, A predetermined foreground ingredient picture to which motion dotage was adjusted, and a predetermined background component image are made to compound with the computed mixture ratio based on initial position information, movement quantity, and the motion direction of a foreground ingredient picture of as significant information, and image composing can be made to generate.

[0026]A foreground ingredient image identifier which identifies a predetermined foreground ingredient picture with a user's demand information in said demand information input means, Make a background component image identifier which identifies a predetermined background component image, and significant information input, and to a synthesizing means. A foreground ingredient picture corresponding to a foreground ingredient image identifier according to a foreground ingredient image identifier which identifies a predetermined foreground ingredient picture with demand information, a background component image identifier which identifies a predetermined background component image, and significant information, A background component image corresponding to a background component image identifier is made to compound based on significant information, and image composing can be made to generate.

[0027]A charging means which performs accounting can be made to establish further according to said demand information.

[0028]Accounting information which includes a user's identifier, an identifier of a communication apparatus, and amount information corresponding to demand information according to demand information is generated in said charging means, and it can be made to perform accounting to a user's financial account based on

accounting information.

[0029]Can make a point storage means which memorizes a point for every user used for said accounting establish further, and to a charging means. Accounting information which includes a user's identifier, an identifier of a communication apparatus, and amount information corresponding to image composing according to demand information is generated, and accounting can be performed when only a part corresponding to amount information subtracts a point size memorized by point storage means.

[0030]After accounting is completed by a charging means, a user's communication apparatus which accounting completed can be made to output image composing to said output means.

[0031]This invention is characterized by a correspondence procedure of a communications system comprising the following.

A demand information inputting step into which a correspondence procedure of the 1st communication apparatus inputs a user's demand information.

A demand transmitting information step which transmits demand information inputted by processing of a demand information inputting step to the 2nd communication apparatus.

A demand information reception step to which a correspondence procedure of the 2nd communication apparatus receives demand information transmitted from the 1st communication apparatus including an image composing receiving step which receives image composing transmitted from the 2nd communication apparatus according to demand information.

A foreground ingredient picture which consists of a foreground object ingredient which constitutes a foreground object of image data which consists of a pixel value determined according to quantity of light which constitutes a picture with which it integrated in time for every pixel according to demand information, A synthetic step which compounds a background component image which consists of a background object component which constitutes background objects of image data, and generates image composing, and an image composing transmission step which transmits image composing generated by processing of a synthetic step to the 1st communication apparatus.

[0032]This invention is characterized by a program of the 2nd recording medium comprising the following.

A demand information inputting control step by which a program which controls the 1st communication apparatus controls an input of a user's demand information.

A demand transmitting information control step which controls transmission to the 2nd communication apparatus of demand information inputted by processing of a demand information inputting control step.

A demand information reception control step which controls reception of demand information to which a program which controls the 2nd communication apparatus is transmitted from the 1st communication apparatus including an image composing reception-control step which controls reception of image composing transmitted from the 2nd communication apparatus according to demand information.
A foreground ingredient picture which consists of a foreground object ingredient which constitutes a foreground object of image data which consists of a pixel value determined according to quantity of light which constitutes a picture with which it integrated in time for every pixel according to demand information, A synthetic control step which controls composition of a background component image which consists of a background object component which constitutes background objects of image data, and generation of image composing, and an image composing transmission-control step which controls transmission to the 1st communication apparatus of image composing generated by processing of a synthetic control step.

[0033]A demand information inputting control step which controls an input of a user's demand information to a computer by which the 2nd program of this invention controls the 1st communication apparatus, A demand transmitting information control step which controls transmission to the 2nd communication apparatus of demand information inputted by processing of a demand information inputting control step, According to demand information, an image composing reception-control step which controls reception of image composing transmitted from the 2nd communication apparatus is performed, A demand information reception control step which controls reception of demand information transmitted to a computer which controls the 2nd communication apparatus from the 1st communication apparatus, A foreground ingredient picture which consists of a foreground object ingredient which constitutes a foreground object of image data which consists of a pixel value determined according to quantity of light which constitutes a picture with which it integrated in time for every pixel according to demand information, Composition of a background component image which consists of a background object component which constitutes background objects of image data, A synthetic control step which controls generation of image composing, and an image composing transmission-control step which controls transmission to the 1st communication apparatus of image composing generated by processing of a synthetic control step are performed.
[0034]This invention is characterized by the 2nd communication apparatus comprising the following.
A demand information input means which inputs a user's demand information.
A demand information transmission means which transmits demand information inputted by a demand information input means to other communication apparatus.
An image composing reception means which receives image composing transmitted

from other communication apparatus according to demand information.

[0035]This invention is characterized by the 2nd correspondence procedure comprising the following.
A demand information inputting step which inputs a user's demand information.
A demand transmitting information step which transmits demand information inputted by processing of a demand information inputting step to other communication apparatus.
An image composing receiving step which receives image composing transmitted from other communication apparatus according to demand information.

[0036]This invention is characterized by a program of the 3rd recording medium comprising the following.
A demand information inputting control step which controls an input of a user's demand information.
A demand transmitting information control step which controls transmission to other communication apparatus of demand information inputted by processing of a demand information inputting control step.
An image composing reception-control step which controls reception of image composing transmitted from other communication apparatus according to demand information.

[0037]A demand information inputting control step by which the 3rd program of this invention controls an input of a user's demand information, A demand transmitting information control step which controls transmission to other communication apparatus of demand information inputted by processing of a demand information inputting control step, and an image composing reception-control step which controls reception of image composing transmitted from other communication apparatus according to demand information are performed.
[0038]This invention is characterized by the 3rd communication apparatus comprising the following.
A demand information receiving means which receives demand information transmitted from other communication apparatus.
A foreground ingredient picture which consists of a foreground object ingredient which constitutes a foreground object of image data which consists of a pixel value determined according to quantity of light which constitutes a picture with which it integrated in time for every pixel according to demand information.
A synthesizing means which compounds a background component image which consists of a background object component which constitutes background objects of image data, and generates image composing.

An image composing transmitting means which transmits image composing generated by synthesizing means to other communication apparatus.

[0039]This invention is characterized by the 3rd correspondence procedure comprising the following.
A demand information reception step which receives demand information transmitted from other communication apparatus.
A foreground ingredient picture which consists of a foreground object ingredient which constitutes a foreground object of image data which consists of a pixel value determined according to quantity of light which constitutes a picture with which it integrated in time for every pixel according to demand information.
A synthetic step which compounds a background component image which consists of a background object component which constitutes background objects of image data, and generates image composing.
An image composing transmission step which transmits image composing generated by processing of a synthetic step to other communication apparatus.

[0040]This invention is characterized by a program of the 4th recording medium comprising the following.
A demand information reception control step which controls reception of demand information transmitted from other communication apparatus.
A foreground ingredient picture which consists of a foreground object ingredient which constitutes a foreground object of image data which consists of a pixel value determined according to quantity of light which constitutes a picture with which it integrated in time for every pixel according to demand information.
A synthetic control step which compounds a background component image which consists of a background object component which constitutes background objects of image data, and controls generation of image composing.
An image composing transmission-control step which controls transmission to other communication apparatus of image composing generated by processing of a synthetic control step.

[0041]A demand information reception control step by which the 4th program of this invention controls reception of demand information transmitted from other communication apparatus, A foreground ingredient picture which consists of a foreground object ingredient which constitutes a foreground object of image data which consists of a pixel value determined according to quantity of light which constitutes a picture with which it integrated in time for every pixel according to demand information, A synthetic control step which compounds a background component image which consists of a background object component which

constitutes background objects of image data, and controls generation of image composing, An image composing transmission-control step which controls transmission to other communication apparatus of image composing generated by processing of a synthetic control step is performed.

[0042]In the 1st communication apparatus of this invention, a method, and a program, a user's demand information being inputted and responding to demand information -- every pixel -- and, A foreground ingredient picture which consists of a foreground object ingredient which constitutes a foreground object of image data which consists of a pixel value determined according to quantity of light which constitutes a picture with which it integrated in time, A background component image which consists of a background object component which constitutes background objects of image data is compounded, image composing is generated, and generated image composing is outputted.

[0043]A user's demand information is inputted into a communications system and a method of this invention by the 1st communication apparatus, It is received by image composing in which it is transmitted to the 2nd communication apparatus, and inputted demand information is transmitted from the 2nd communication apparatus according to demand information, and with the 2nd communication apparatus. Demand information transmitted from the 1st communication apparatus is received, and according to demand information, A foreground ingredient picture which consists of a foreground object ingredient which constitutes a foreground object of image data which consists of a pixel value determined according to quantity of light which constitutes a picture with which it integrated in time for every pixel, A background component image which consists of a background object component which constitutes background objects of image data is compounded, image composing is generated and generated image composing is transmitted to the 1st communication apparatus.

[0044]In the 2nd communication apparatus of this invention, a method, and a program, image composing in which it is inputted, inputted demand information is transmitted to other communication apparatus, and a user's demand information is transmitted from other communication apparatus according to demand information is received.

[0045]In the 3rd communication apparatus of this invention, a method, and a program, Demand information transmitted from other communication apparatus is received, and according to demand information, A foreground ingredient picture which consists of a foreground object ingredient which constitutes a foreground object of image data which consists of a pixel value determined according to quantity of light which constitutes a picture with which it integrated in time for every pixel, A background component image which consists of a background object component which constitutes background objects of image data is compounded, image composing is generated and generated image composing is transmitted to other communication

apparatus.
[0046]
[Embodiment of the Invention]Drawing 1 is a figure showing the 1 embodiment of the image processing system concerning this invention.
[0047]The image processing system of this invention for example, the network 1 top, such as the Internet, -- the separation server 11, the motion detection server 12, the field specific server 13, the mixture ratio calculation server 14, the foreground background separation processing server 15, and a motion -- a Japanese quince -- adjustment server 16, coding server 17, and storage-servers 18-1,18-2 and the synthetic server 19. the correction server 20, the purchase server 21, the sale server 22, the retrieval server 23, the fee collection server 24, the financial server (for customers) 25, the financial server (for donors) 26, and the client computer 27 -- and, The camera terminal device 28-1 thru/or 28-n have composition which is connected, and can deliver and receive data mutually. the separation server 11, the motion detection server 12, the field specific server 13, the mixture ratio calculation server 14, the foreground background separation processing server 15, and a motion -- a Japanese quince -- the adjustment server 16, the coding server 17, the synthetic server 19, the correction server 20, the purchase server 21, the sale server 22, and the retrieval server 23. The fee collection server 24, the financial server (for customers) 25, and the financial server (for donors) 26, Respectively Separation service, motion detection service, field specific service, mixture ratio calculation service, Foreground-background-separation-give one's service, move and Japanese quince adjustment service, coding service, synthetic service, They are management or a server managed by the donor who provides correction service, purchase service, sale service, a search service, fee collection service, and financial service (the object for customers, and for donors). In the following explanation, when it is not necessary to distinguish storage-servers 18-1,18-2 and the camera terminal device 28-1 thru/or 28-n separately, the storage servers 18 and the camera terminal device 28 are only called. Suppose that it is the same also about other servers and apparatus.
[0048]Drawing 2 is a figure showing the composition of the separation server 11 concerning this invention. CPU(Central Processing Unit) 41 performs various kinds of processings according to the program memorized by ROM(Read Only Memory) 42 or the storage parts store 48. A program, data, etc. which CPU41 performs are suitably memorized by RAM(Random Access Memory) 43. These CPU41, ROM42, and RAM43 are mutually connected by bus 44.
[0049]The input/output interface 45 is connected to CPU41 via the bus 44 again. The outputting part 47 which consists of the input part 46, a display, a loudspeaker, etc. which consist of a keyboard, a mouse, a microphone, etc. is connected to the input/output interface 45. CPU41 performs various kinds of processings corresponding to the instructions inputted from the input part 46. And CPU41 outputs

a picture, a sound, etc. which were obtained as a result of processing to the outputting part 47.

[0050]The storage parts store 48 connected to the input/output interface 45 comprises a hard disk etc., for example, and memorizes the program and various kinds of data which CPU41 performs. The communications department 49 communicates with an external device via the network of the Internet and others.

[0051]A program may be acquired via the communications department 49 and it may memorize to the storage parts store 48.

[0052]When equipped with the magnetic disk 61, the optical disc 62, the magneto-optical disc 63, or the semiconductor memory 64, the drive 50 connected to the input/output interface 45 drives them, and acquires a program, data, etc. which are recorded there. If needed, the program and data which were acquired are transmitted to the storage parts store 48, and are memorized.

[0053]In addition, the motion detection server 12, the field specific server 13, the mixture ratio calculation server 14, the foreground background separation processing server 15, and a motion -- a Japanese quince -- adjustment server 16, coding server 17, and storage-servers 18-1,18-2, the synthetic server 19, the correction server 20, the purchase server 21, the sale server 22, and the retrieval server 23. Since the basic constitution is the same as that of the separation server 11 about the fee collection server 24, the financial server (for customers) 25, the financial server (for donors) 26, and the client computer 27, the explanation is omitted.

[0054]Drawing 3 is a figure showing the composition of the camera terminal device 28 concerning this invention. The composition of the camera terminal device 28 is provided in the input part 76 by the sensor 76a and GPS(Global Positioning System)76b, and to the outputting part 77. Except that LCD(Liquid Crystal Display)77a is provided, it has composition of the separation server 11, and the same composition. namely, CPU71 of the camera terminal device 28, ROM72, RAM73, the bus 74, the input/output interface 75, the input part 76, the outputting part 77, the storage parts store 78, the communications department 79, the drive 80, the magnetic disk 91, the optical disc 92, and the magneto-optical disc 93 -- and, The semiconductor memory 94, respectively -- CPU41 of the separation server 11, ROM42, RAM43, the bus 44, the input/output interface 45, the input part 46, the outputting part 47, the storage parts store 48, the communications department 49, the drive 50, the magnetic disk 61, the optical disc 62, and the magneto-optical disc 63 -- and, The semiconductor memory 64 is supported, respectively.

[0055]The sensor 76a outputs the picture which is an image sensor and was picturized to the input part 76. Based on the signal transmitted from the geostationary satellite which is not illustrated, GPS76b detects the position information (latitude and longitude) on the earth, and outputs the detected position information to the input part 76. LCD77a displays the picture outputted from an outputting part.

[0056]Next, the separation server 11 is explained with reference to drawing 4 and drawing 5.

[0057]As drawing 4 shows, the separation server 11 via the network 1 with the technique of mentioning later the picture inputted from the client computer 27 etc. separating into a foreground ingredient picture and a background component image -- an inputted image and a foreground ingredient picture -- and, It is made to output and accumulate in the storage servers 18 which attached and generate ID (Identifier) to each of a background component image, and are outputted to the client computer 27 and which are memorized by oneself, or it outputs to the server of others on a network, and it is made to memorize. Here, a foreground ingredient picture shows the picture which has an ingredient of the motion in the picture inputted, and a background component image shows the picture of the stationary part which does not contain the motion ingredient in the picture inputted. At this time, the accounting part 11a performs accounting of the fee made in separation to the fee collection server 24 via the network 1. As drawing 5 shows, the separation server 11, If picture ID which specifies a picture is inputted instead of a picture, will access the retrieval server 23 and the storage servers 18 on the network 1 which are mentioned later, or its storage parts store (for example, storage parts store 78 of drawing 3) is searched, After reading the image data corresponding to inputted picture ID and separating into a foreground ingredient picture and a background component image, ID corresponding to each is attached and processing corresponding to [memorize by oneself or / output to the server of others on the network 1, and] the server is performed.

[0058]In the following explanation, although picture ID is explained as an example as information which specifies a picture, what is necessary is just to be the information which can specify a picture, and they may be image position data mentioned later.

[0059]Next, the motion detection server 12 is explained with reference to drawing 6 and drawing 7.

[0060]As drawing 6 shows, the object extraction part 12a of the motion detection server 12 extracts the image object in the picture inputted from the client computer 27 etc., for example, and outputs it to the motion detection part 12b. The motion detection part 12b performs processing corresponding to [memorize by oneself or / output to the server of others on the network 1, and] the server which detects the motion vector and position information of the inputted image object, and is outputted to the client computer 27. Under the present circumstances, the accounting part 12c performs accounting of the fee made in the motion vector for every image object, and processing of detection of position information to the fee collection server 24 via the network 1. In this specification, the picture corresponding to the object in the real world which is the target of an image pick-up is called an object.

[0061]As drawing 7 shows, the motion detection server 12, If picture ID which specifies a picture is inputted instead of a picture, will access the retrieval server 23

and the storage servers 18 on the network 1 which are mentioned later, or its storage parts store (for example, storage parts store 78 of drawing 3) is searched, The image data corresponding to inputted picture ID is read, and the same processing as the above is performed.

[0062]Next, the field specific server 13 is explained with reference to drawing 8 and drawing 9.

[0063]As drawing 8 shows, the field specific server 13 via the network 1 using the object specification information that the object in the picture inputted from the client computer 27 etc. and its picture is specified. Each of the pixel of a picture which was inputted is specified as either a foreground region, a background region or a mixing zone, The information which shows whether it belongs to either a foreground region, a background region or a mixing zone for every pixel. Processing corresponding to [memorize by oneself or / output to the server of others on the network 1, and] the server which generates (area information is called hereafter) and outputted to the client computer 27 is performed. At this time, the accounting part 13a performs accounting of the fee made in field specific processing to the fee collection server 24 via the network 1. As drawing 9 shows, the field specific server 13, If picture ID which specifies a picture is inputted instead of a picture, will access the retrieval server 23 and the storage servers 18 on the network 1 which are mentioned later, or its storage parts store (for example, storage parts store 78 of drawing 3) is searched, The picture corresponding to inputted picture ID is called, and the area information corresponding to the object specification information on the picture is outputted.

[0064]Next, the mixture ratio calculation server 14 is explained with reference to drawing 10 and drawing 11.

[0065]As drawing 10 shows, the mixture ratio calculation server 14 via the network 1, For example, the picture inputted from the client computer 27 etc., the object specification information that the object in the picture is specified, And based on area information, the mixture ratio (the mixture ratio alpha is called hereafter) corresponding to the pixel contained in a mixing zone is computed, It outputs to the server of others on a network, and processing corresponding to [memorize by oneself which outputs the computed mixture ratio to the client computer 27, or] the server is performed. At this time, the accounting part 14a performs accounting of the fee made in mixture ratio calculation processing to the fee collection server 24 via the network 1. As drawing 11 shows, the mixture ratio calculation server 14, If picture ID which specifies a picture is inputted instead of a picture, will access the retrieval server 23 and the storage servers 18 on the network 1 which are mentioned later, or its storage parts store (for example, storage parts store 78 of drawing 3) is searched, The picture corresponding to inputted picture ID is called, and the same processing as **** is performed.

[0066]Next, with reference to drawing 12 and drawing 13, the foreground background

separation processing server 15 is explained.

[0067]As drawing 12 shows, the foreground background separation processing server 15 via the network 1, For example, the picture inputted from the client computer 27 etc., the object specification information that the object in the picture is specified, The foreground ingredient picture which comprises only the ingredient (it is also hereafter called the ingredient of a foreground) of the picture corresponding to the object of a foreground based on area information and the mixture ratio alpha, An inputted image is divided into the background component image which comprises only the ingredient (it is also hereafter called the ingredient of a background) of a background, Processing corresponding to [memorize by oneself or / output to the server of others on a network and] the server which attaches ID for every picture and is outputted to the client computer 27 is performed. At this time, the accounting part 15a performs accounting of the fee made in foreground background separation processing to the fee collection server 24 via the network 1. As drawing 13 shows, the foreground background separation processing server 15, If picture ID which specifies a picture is inputted instead of a picture, will access the retrieval server 23 and the storage servers 18 on the network 1 which are mentioned later, or its storage parts store (for example, storage parts store 78 of drawing 3) is searched, The picture corresponding to inputted picture ID is called, and the same processing as **** is performed.

[0068]Next, with reference to drawing 14 and drawing 15, it moves and the Japanese quince adjustment server 16 is explained.

[0069]As drawing 14 shows, the motion dotage adjustment server 16 via the network 1, For example, the foreground ingredient picture inputted from the client computer 27 etc., the motion included in a foreground ingredient picture based on a motion vector and motion blur quantity -- the motion which removes a Japanese quince -- the quantity of a Japanese quince is decreased -- or a motion -- the motion included in a foreground ingredient picture, such as making the quantity of a Japanese quince increase etc., -- the quantity of a Japanese quince, [adjust and] It outputs to the server of others on a network, and processing corresponding to [memorize by oneself which generates the foreground ingredient picture which adjusted the quantity of motion dotage, attaches ID for every picture, and is outputted to the client computer 27, or] the server is performed. At this time, the accounting part 16a performs accounting of the fee which moves to the fee collection server 24 via the network 1, and is made in Japanese quince regulated treatment. As drawing 15 shows, move and the Japanese quince adjustment server 16, If foreground ingredient picture ID which specifies a foreground ingredient picture is inputted instead of a foreground ingredient picture, The retrieval server 23 and the storage servers 18 on the network 1 which are mentioned later are accessed, or its storage parts store (for example, storage parts store 78 of drawing 3) is searched, the foreground ingredient picture corresponding to

inputted foreground ingredient picture ID is called, and the same processing as **** is performed.

[0070]Next, the coding server 17 is explained with reference to drawing 16 and drawing 17.

[0071]As drawing 16 shows, the coding server 17 via the network 1, . For example, divide into a foreground ingredient picture and a background component image the picture inputted from the client computer 27 etc., give ID to each, and memorize by oneself. Or foreground ingredient pictures, such as URL (Universal Resource Locator) etc. of the server which outputs to the server of others on a network, made it memorize, and was made to memorize, And the foreground ingredient image position data which consist of numerals which show the position on the network 1 of the server to which the background component image was outputted (memory), and background component image position information are generated, and it outputs with the motion vector of those pictures, position information, and the information of the mixture ratio. The information which encoded information outputs may be any of encoded information, a picture, a picture, and encoded information, and can change the information outputted if needed. At this time, the accounting part 17a performs accounting of the fee made in coding processing to the fee collection server 24 via the network 1. As drawing 17 shows, the coding server 17, If picture ID which specifies a picture is inputted instead of a picture, will access the retrieval server 23 and the storage servers 18 on the network 1 which are mentioned later, or its storage parts store (for example, storage parts store 78 of drawing 3) is searched, The picture corresponding to inputted picture ID is called, and the same processing as **** is performed.

[0072]Next, the storage servers 18 are explained with reference to drawing 18 and drawing 19.

[0073]As drawing 18 shows, it is connected on the network 1, and the storage servers 18 accumulate the picture transmitted from various kinds of servers, and they output the image position data corresponding to the stored-up picture with picture ID. By these image position data, the client computer 27 can be accessed via the network 1, and can call a desired picture, for example. That is, as drawing 19 shows, the client computer 27 can read the picture for which it asks by accessing the network 1-like storage servers 18, and specifying picture ID corresponding to the picture considered as a request based on image position data. Although image position data and picture ID are independently explained in this specification, It may be made to make it a part of picture ID, and may enable it, as for image position data, to recognize which server on the network 1 things can be carried out and memorizes [which recognizes image position data by picture ID in this case] (accumulation or processing). It may be made for the storage servers 18 to memorize a motion vector, position information, the mixture ratio, and motion blur quantity besides image data.

[0074]Next, the synthetic server 19 is explained with reference to drawing 20 and drawing 21.

[0075]As drawing 20 shows, the synthetic server 19 via the network 1, For example, two pictures of the pictures A and B inputted from the client computer 27 etc., Combine the pictures A and B from a motion vector and position information, the mixture ratio, and motion blur quantity, and image composing (A+B) is generated, Processing corresponding to [memorize by oneself or / output to the server of others on the network 1, and] the server outputted to the client computer 27 is performed. In this case, as for the pictures A and B, both will be compounded by treating one side as a foreground ingredient picture, and treating another side as a background component image. At this time, the accounting part 19a performs accounting of the fee made in a compositing process to the fee collection server 24 via the network 1. As drawing 21 shows, the synthetic server 19, If picture A-ID and B-ID which specify a picture are inputted instead of the pictures A and B, The retrieval server 23 and the storage servers 18 on the network 1 which are mentioned later are accessed, or its storage parts store (for example, storage parts store 78 of drawing 3) is searched, the picture corresponding to picture A-ID and B-ID which were inputted is called, and the same processing as **** is performed.

[0076]Next, the correction server 20 is explained with reference to drawing 22 and drawing 23.

[0077]As drawing 22 shows, the correction server 20 via the network 1, For example, the picture inputted from the client computer 27 etc., Processing corresponding to [memorize by oneself or / output to the server of others on a network and] the server which corrects based on a motion vector and position information, the mixture ratio, and motion blur quantity, generates a corrected image, and is outputted to the client computer 27 is performed. At this time, the accounting part 20a performs accounting of the fee made in correction processing to the fee collection server 24 via the network 1. As drawing 23 shows, the correction server 20, If picture ID which specifies a picture is inputted instead of a picture, will access the retrieval server 23 and the storage servers 18 on the network 1 which are mentioned later, or its storage parts store (for example, storage parts store 78 of drawing 3) is searched, The picture corresponding to inputted picture ID is called, and the same processing as **** is performed.

[0078]Next, the purchase server 21 is explained with reference to drawing 24.

[0079]As drawing 24 shows, the purchase server 21 via the network 1, For example, if picture ID which specifies the picture which the client computer 27 etc. are operated by the user who wishes the purchase of a predetermined picture, and wishes to purchase is inputted, A corresponding picture is accessed at the separation server 11, the storage servers 18, the synthetic server 19, or the correction server 20 on the network 1, etc., a corresponding picture is called, and it outputs to the client computer

27. At this time, the accounting part 21a performs accounting of the fee concerning the picture purchased to the fee collection server 24 via the network 1.

[0080]Next, the sale server 22 is explained with reference to drawing 25.

[0081]As drawing 25 shows, the sale server 22 via the network 1 For example, the separation server 11, the synthetic server 19, Or the separation picture, image composing which were generated by the correction server 20 and which a predetermined user owns, When the picture which wishes sale of a corrected image is inputted, the picture which wishes to sell off Or the separation server 11 on the network 1, the storage servers 18, the synthetic server 19, Or make the correction server 20 etc. memorize and the accounting part 22a receives the fee collection server 24 via the network 1, Accounting of the fee concerning the picture to sell off is performed (in this case, the donor of sale processing service will perform payment processing for the price corresponding to the picture sold off to the user who wishes to sell off).

[0082]Next, the retrieval server 26 is explained with reference to drawing 26.

[0083]The information the retrieval server 26 indicates the feature of the picture which a user considers as a request with the client computer 1 to be, for example, The picture picturized now or the picture picturized beforehand is searched with the camera terminal device 28-1 on the network 1 thru/or 28-n from the physical position information on the camera terminal device 28-1 thru/or 28-n, and it outputs to the client computer 1 as a demand picture. At this time, the accounting part 23a performs accounting of the fee made in retrieval processing to the fee collection server 24 via the network 1.

[0084]In this specification, with coding, it shall call it coding to change into the foreground ingredient picture acquired based on image data, a background component image, a motion vector, position information, motion blur quantity, and the information on the mixture ratio, and the data shall be called coding data.

[0085]Drawing 27 is a block diagram showing the separation server 11.

[0086]It is not asked whether each function of the separation server 11 is realized by hardware, or software realizes. That is, even if it considers each block diagram of this specification to be a block diagram of hardware, it may be considered to be a functional block diagram by software.

[0087]The inputted image supplied to the separation server 11 is supplied to the object extraction part 101, the field specific part 103, the mixture ratio calculation part 104, and the foreground background separation part 105.

[0088]The object extraction part 101 extracts coarsely the image object corresponding to the object of the foreground included in an inputted image, and supplies the extracted image object to the motion detection part 102. The object extraction part 101 is, detecting the outline of the image object corresponding to the object of the foreground included in an inputted image for example, and extracts the

image object corresponding to the object of a foreground coarsely.

[0089]The object extraction part 101 extracts coarsely the image object corresponding to the object of the background included in an inputted image, and supplies the extracted image object to the motion detection part 102. The object extraction part 101 extracts the image object corresponding to the object of a background from the difference of an inputted image and the image object corresponding to the object of the extracted foreground coarsely, for example.

[0090]For example, the object extraction part 101, It may be made to extract coarsely the image object corresponding to the object of a foreground, and the image object corresponding to the object of a background from the difference of the picture of the background memorized by the background memory provided in the inside, and an inputted image.

[0091]The motion detection part 102, for example with techniques, such as the block matching method, a gradient method, a phase correlation technique, and the pel recursive method. The motion vector of the image object corresponding to the object of the foreground extracted coarsely is computed, and the position information on the computed motion vector and a motion vector (information which pinpoints the position of the pixel corresponding to a motion vector) is supplied to the field specific part 103 and the motion dotage controller 106.

[0092]The information corresponding to movement quantity v is included in the motion vector which the motion detection part 102 outputs.

[0093]The motion detection part 102 moves and it may be made to, output the motion vector for every image object to the Japanese quince controller 106 for example, with the picture element position information which specifies a pixel as an image object.

[0094]Movement quantity v is a value which expresses a pixel interval for change of the position of the picture corresponding to the object which is moving as a unit. For example, while moving so that it may be displayed on the position which the picture of the object corresponding to a foreground left by 4 pixels in the following frame on the basis of a certain frame, movement quantity v of the picture of the object corresponding to a foreground is set to 4.

[0095]The object extraction part 101 and the motion detection part 102 are needed when adjusting the motion blur quantity corresponding to the object which is moving.

[0096]The field specific part 103 each of the pixel of a picture which was inputted A foreground region, It specifies as either a background region or a mixing zone, and the information which shows whether it belongs to either a foreground region, a background region or a mixing zone for every pixel is supplied to the mixture ratio calculation part 104, the foreground background separation part 105, and the motion dotage controller 106.

[0097]Based on an inputted image and the area information supplied from the field specific part 103, the mixture ratio calculation part 104 computes the mixture ratio

corresponding to the pixel contained in a mixing zone, and supplies the computed mixture ratio to the foreground background separation part 105.

[0098]the mixture ratio -- alpha is a value which shows the rate of the ingredient (it is also hereafter called the ingredient of a background) of the picture corresponding to the object of a background in a pixel value, as shown in the formula (3) mentioned later.

[0099]The area information to which the foreground background separation part 105 was supplied from the field specific part 103, and the mixture ratio supplied from the mixture ratio calculation part 104 -- with the foreground ingredient picture which comprises only the ingredient (it is also hereafter called the ingredient of a foreground) of the picture corresponding to the object of a foreground based on alpha. An inputted image is divided into the background component image which comprises only the ingredient of a background, it moves and a foreground ingredient picture is supplied to the Japanese quince controller 106 and the selecting part 107. Considering the separated foreground ingredient picture as a final output is also considered. Only a foreground and a background can be specified and an exact foreground and background can be acquired compared with the separated method without taking the conventional mixing zone into consideration.

[0100]The motion dotage controller 106 determines the batch which shows one or more pixels contained in a foreground ingredient picture based on movement quantity v and area information which a motion vector shows. A batch is data which specifies the pixel of one group which is the target of processing of adjustment of the quantity of motion dotage.

[0101]The motion dotage controller 106 was inputted into the separation server 11, move, and The amount of Japanese quince adjustments, The motion vector supplied from the foreground ingredient picture supplied from the foreground background separation part 105, and the motion detection part 102, and its position information, and the motion included in a foreground ingredient picture based on a batch -- the motion which removes a Japanese quince -- the quantity of a Japanese quince is decreased -- or a motion -- the motion included in a foreground ingredient picture, such as making the quantity of a Japanese quince increase etc., -- adjusting the quantity of a Japanese quince -- a motion -- the foreground ingredient picture which adjusted the quantity of the Japanese quince is outputted to the selecting part 107. A motion vector and its position information may not be used.

[0102]Here, motion dotage means distortion included in the picture corresponding to the object which is moving produced with the motion of the object in the real world which is the target of an image pick-up, and the characteristic of an image pick-up of a sensor.

[0103]The selecting part 107 chooses either one of the foreground ingredient picture supplied from the foreground background separation part 105 based on the selection signal corresponding to the user's selection, and the foreground ingredient picture to

which was supplied from the motion dotage controller 106, it moved, and the quantity of the Japanese quince was adjusted, for example, and outputs the selected foreground ingredient picture.

[0104]Next, with reference to drawing 28 thru/or drawing 43, the inputted image supplied to the separation server 11 is explained.

[0105]Drawing 28 is a figure explaining the image pick-up by the sensor 76a. The sensor 76a comprises a CCD video camera etc. which were provided with the CCD (Charge-Coupled Device) area sensor which is a solid state image pickup device, for example. The object corresponding to a foreground in the real world moves at a level with right-hand side from the left-hand side in a figure between the object corresponding to a background in the real world, and sensors, for example.

[0106]The sensor 76a picturizes the object corresponding to a foreground with the object corresponding to a background. The sensor 76a outputs the picturized picture per frame. For example, the sensor 76a outputs the picture which comprises 30 frames in 1 second. Exposure time of the sensor 76a can be made into 1 / 30 seconds. Exposure time is a period until it ends conversion to the electric charge of the inputted light, after starting conversion to the electric charge of the light into which the sensor 76a was inputted. Hereafter, exposure time is also called shutter time.

[0107]Drawing 29 is a figure explaining arrangement of a pixel. In drawing 29, A thru/or I show each pixel. The pixel is arranged on the flat surface corresponding to a picture. One sensing element corresponding to one pixel is arranged on the sensor 76a. When the sensor 76a picturizes a picture, one sensing element outputs the pixel value corresponding to one pixel which constitutes a picture. For example, the position of the direction of X of a sensing element is equivalent to the position of the transverse direction on a picture, and the position of the direction of Y of a sensing element is equivalent to the position of the lengthwise direction on a picture.

[0108]As shown in drawing 30, the sensing element which is CCD changes the period corresponding to shutter time, and the inputted light into an electric charge, and accumulates the changed electric charge. The quantity of an electric charge is proportional to the inputted intensity of light and the time when light is inputted mostly. In the period corresponding to shutter time, the sensing element adds the electric charge changed from the inputted light to the already accumulated electric charge. That is, a sensing element integrates with the period corresponding to shutter time, and the light inputted, and accumulates the electric charge of the quantity corresponding to the light with which it integrated. It can be said that a sensing element has the storage effect to time.

[0109]The electric charge accumulated in the sensing element is transformed into a pressure value by the circuit which is not illustrated, and a pressure value is further changed and outputted to the pixel value of digital data etc. Therefore, each pixel value outputted from the sensor 76a has the value projected on the one-dimensional

space which is the result of integrating with a certain portion into which the object corresponding to a foreground or a background has breadth spatially about shutter time.

[0110]The separation server 11 extracts the significant information alpha buried in the output signal, for example, the mixture ratio, by operation of such accumulation of the sensor 76a. The separation server 11 adjusts the quantity which is distortion by the image object of a foreground itself being mixed to produce, for example, the quantity of motion dotage, etc. The separation server 11 adjusts the quantity of distortion produced when the image object of a foreground and the image object of a background are mixed.

[0111]Drawing 31 is a figure explaining the picture acquired by picturizing the object corresponding to the foreground currently moved, and the object corresponding to a stationary background. Drawing 31 (A) shows the picture acquired by picturizing the object corresponding to the foreground accompanied by a motion, and the object corresponding to a stationary background. In the example shown in drawing 31 (A), the object corresponding to a foreground is moving to the right from the left horizontally to the screen.

[0112]Drawing 31 (B) is the model figure which developed the pixel value corresponding to one line of the picture shown in drawing 31 (A) to the time direction. The transverse direction of drawing 31 (B) corresponds in the direction X of space of drawing 31 (A).

[0113]The pixel value comprises only an ingredient of the picture corresponding to the ingredient of a background, i.e., the object of a background, in the pixel of a background region. The pixel value comprises only an ingredient of the picture corresponding to the ingredient of a foreground, i.e., the object of a foreground, in the pixel of a foreground region.

[0114]As for the pixel of the mixing zone, the pixel value comprises an ingredient of a background, and an ingredient of the foreground. Since the pixel value comprises an ingredient of a background, and an ingredient of the foreground, the mixing zone can say it also as a distortion area. A mixing zone is further classified into a covered background region and an uncovered background region.

[0115]A covered background region is a mixing zone of the position corresponding to the front end part of the direction of movement of the object of a foreground to a foreground region, and the field where a background component is covered by the foreground corresponding to the passage of time is said.

[0116]On the other hand, an uncovered background region is a mixing zone of the position corresponding to the rear end part of the direction of movement of the object of a foreground to a foreground region, and the field where a background component appears corresponding to the passage of time is said.

[0117]Thus, a picture including a foreground region, a background region, a covered

background region, or an uncovered background region is inputted into the field specific part 103, the mixture ratio calculation part 104, and the foreground background separation part 105 as an inputted image.

[0118]Drawing 32 is a figure explaining above background regions and foreground regions, a mixing zone, a covered background region, and an uncovered background region. When it corresponds to the picture shown in drawing 31, a background region is a stationary part, a foreground region is a motion portion, the covered background region of a mixing zone is a portion which changes from a background to a foreground, and the uncovered background region of a mixing zone is a portion which changes from a foreground to a background.

[0119]Drawing 33 is the model figure in the picture which picturized the object corresponding to a stationary foreground, and the object corresponding to a stationary background which developed the pixel value of the pixel adjacently located in a line with one row to the time direction. For example, the pixel located in a line on one line of a screen can be chosen as a pixel adjacently located in a line with one row.

[0120]The pixel value of F01 thru/or F04 which are shown in drawing 33 is a pixel value of the pixel corresponding to the stationary object of a foreground. The pixel value of B01 thru/or B04 which are shown in drawing 33 is a pixel value of the pixel corresponding to the stationary object of a background.

[0121]The lengthwise direction in drawing 33 corresponds to time, and time passes toward the bottom since on in a figure. The position of the top chord of the rectangle in drawing 33 corresponds to the time which starts conversion to the electric charge of the light into which the sensor 76a was inputted, and the position of the lower side of the rectangle in drawing 33 corresponds to the time which ends conversion to the electric charge of the light into which the sensor 76a was inputted. That is, the distance from the top chord of the rectangle in drawing 33 to the lower side corresponds to shutter time.

[0122]Below, the case where shutter time and a frame interval are the same is explained at an example.

[0123]The transverse direction in drawing 33 corresponds in the direction X of space explained by drawing 31. More specifically in the example shown in drawing 33, the distance to the right-hand side of the rectangle indicated to be "B04" from the left side of the rectangle indicated to be "F01" in drawing 33 corresponds by 8 times, i.e., the continuous interval of eight pixels, the pitch of a pixel.

[0124]When the object of a foreground and the object of a background are standing it still, in the period corresponding to shutter time, the light inputted into the sensor 76a does not change.

[0125]Here, the period corresponding to shutter time is divided during the two or more same length. For example, if the virtual number of partitions is set to 4, the model figure shown in drawing 33 can be expressed as a model shown in drawing 9. The

virtual number of partitions is set up corresponding to movement quantity [within the shutter time of the object corresponding to a foreground] v etc. For example, corresponding to movement quantity v which is 4, the virtual number of partitions is set to 4, and the period corresponding to shutter time is divided into four.

[0126]The line of the top in a figure corresponds to the period when the shutter opened in and the beginning was divided. A shutter opens the 2nd line from on in a figure, and it corresponds to the 2nd divided period. A shutter opens the 3rd line from on in a figure, and it corresponds to the 3rd divided period. A shutter opens the 4th line from on in a figure, and it corresponds to the 4th divided period.

[0127]Hereafter, shutter time/v calls the shutter time divided corresponding to movement quantity v.

[0128]Since the light inputted into the sensor 76a does not change while the object corresponding to a foreground is standing it still, the ingredients F01/v of a foreground are equal to the value which **(ed) the pixel value F01 by the virtual number of partitions. Similarly while the object corresponding to a foreground is standing it still, the ingredients F02/v of a foreground, It is equal to the value which **(ed) the pixel value F02 by the virtual number of partitions, and the ingredients F03/v of a foreground are equal to the value which **(ed) the pixel value F03 by the virtual number of partitions, and their ingredients F04/v of a foreground are equal to the value which **(ed) the pixel value F04 by the virtual number of partitions.

[0129]Since the light inputted into the sensor 76a does not change while the object corresponding to a background is standing it still, the ingredients B01/v of a background are equal to the value which **(ed) the pixel value B01 by the virtual number of partitions. Similarly, while the object corresponding to a background is standing it still, the ingredients B02/v of a background are equal to the value which **(ed) the pixel value B02 by the virtual number of partitions, and that of B03/v are equal to the value which **(ed) the pixel value B03 by the virtual number of partitions, and B04/their v is equal to the value which **(ed) the pixel value B04 by the virtual number of partitions.

[0130]Namely, since the light corresponding to the object of a foreground inputted into the sensor 76a does not change in the period corresponding to shutter time when the object corresponding to a foreground is standing it still, The ingredients F01/v of the foreground corresponding to [a shutter opens and] the first shutter time/v, A shutter opens and the ingredients F01/v of the foreground corresponding to the 2nd shutter time / v, the ingredients F01/v of the foreground corresponding to [a shutter opens and] the 3rd shutter time / v, and the ingredients F01/v of the foreground corresponding to [a shutter opens and] the 4th shutter time / v serve as the same value. F02/v thru/or F04/v also have the same relation as F01/v.

[0131]Since the light corresponding to the object of a background inputted into the sensor 76a does not change in the period corresponding to shutter time when the

object corresponding to a background is standing it still, The ingredients B01/v of the background corresponding to [a shutter opens and] the first shutter time/v, A shutter opens and the ingredients B01/v of the background corresponding to the 2nd shutter time / v, the ingredients B01/v of the background corresponding to [a shutter opens and] the 3rd shutter time / v, and the ingredients B01/v of the background corresponding to [a shutter opens and] the 4th shutter time / v serve as the same value. B02/v thru/or B04/v also have the same relation.

[0132]Next, the object corresponding to a foreground moves and the case where the object corresponding to a background is standing it still is explained.

[0133]Drawing 35 is the model figure which developed the pixel value of the pixel on one line to the time direction, including a covered background region in case the object corresponding to a foreground moves toward the right-hand side in a figure. In drawing 35, movement quantity v of a foreground is 4. Since one frame is short time, the object corresponding to a foreground is a rigid body, and it can be assumed that it is moving at uniform velocity. In drawing 35, the picture of the object corresponding to a foreground moves so that it may be displayed on right-hand side by 4 pixels in the following frame on the basis of a certain frame.

[0134]In drawing 35, the 4th pixel belongs to a foreground region from the pixel thru/or the left of most left-hand side. In drawing 35, the left to the 5th thru/or the 7th pixel belong to the mixing zone which is a covered background region from the left. In drawing 35, the pixel of most right-hand side belongs to a background region.

[0135]Since it is moving so that the object corresponding to a foreground may cover the object corresponding to a background with the passage of time, when the ingredient contained in the pixel value of the pixel belonging to a covered background region has a period corresponding to shutter time, it is replaced with the ingredient of a foreground from the ingredient of a background.

[0136]For example, the pixel value M which attached the thick line frame in drawing 35 is expressed with a formula (1).

[0137]

M=B02/v+B02/v+F07/v+F06/v (1)

[0138]For example, since the 5th pixel contains the ingredient of the foreground corresponding to three shutter time / v including the ingredient of the background corresponding to one shutter time / v from the left, the mixture ratio alpha of the 5th pixel is 1/4 from the left. Since the 6th pixel contains the ingredient of the foreground corresponding to two shutter time / v including the ingredient of the background corresponding to two shutter time / v from the left, the mixture ratio alpha of the 6th pixel is 1/2 from the left. Since the 7th pixel contains the ingredient of the foreground corresponding to one shutter time / v including the ingredient of the background corresponding to three shutter time / v from the left, the mixture ratio alpha of the 7th pixel is 3/4 from the left.

[0139]Since it can assume that it moves at uniform velocity so that the object corresponding to a foreground may be a rigid body and the picture of a foreground may be displayed on 4-pixel right-hand side in the following frame, For example, the shutter of the 4th pixel opens from the left in drawing 35, the shutter of the 5th pixel opens the first ingredients F07/v of the foreground of shutter time/v from the left in drawing 35, and it is equal to the ingredient of the foreground corresponding to the 2nd shutter time / v. Similarly, the shutter of the 6th pixel opens the ingredients F07/v of a foreground from the left in drawing 35, and the shutter of the 7th pixel opens them from the ingredient of the foreground corresponding to the 3rd shutter time / v, and the left in drawing 35, and they are equal to the ingredient of the foreground corresponding to the 4th shutter time / v respectively.

[0140]Since it can assume that it moves at uniform velocity so that the object corresponding to a foreground may be a rigid body and the picture of a foreground may be displayed on 4-pixel right-hand side in the following frame, For example, the shutter of the 3rd pixel opens from the left in drawing 35, the shutter of the 4th pixel opens the ingredients F06/v of the foreground of the first shutter time/v from the left in drawing 35, and it is equal to the ingredient of the foreground corresponding to the 2nd shutter time / v. Similarly, the shutter of the 5th pixel opens the ingredients F06/v of a foreground from the left in drawing 35, and the shutter of the 6th pixel opens them from the ingredient of the foreground corresponding to the 3rd shutter time / v, and the left in drawing 35, and they are equal to the ingredient of the foreground corresponding to the 4th shutter time / v respectively.

[0141]Since it can assume that it moves at uniform velocity so that the object corresponding to a foreground may be a rigid body and the picture of a foreground may be displayed on 4-pixel right-hand side in the following frame, For example, the shutter of the 2nd pixel opens from the left in drawing 35, the shutter of the 3rd pixel opens the ingredients F05/v of the foreground of the first shutter time/v from the left in drawing 35, and it is equal to the ingredient of the foreground corresponding to the 2nd shutter time / v. Similarly, the shutter of the 4th pixel opens the ingredients F05/v of a foreground from the left in drawing 35, and the shutter of the 5th pixel opens them from the ingredient of the foreground corresponding to the 3rd shutter time / v, and the left in drawing 35, and they are equal to the ingredient of the foreground corresponding to the 4th shutter time / v respectively.

[0142]Since it can assume that it moves at uniform velocity so that the object corresponding to a foreground may be a rigid body and the picture of a foreground may be displayed on 4-pixel right-hand side in the following frame, For example, the shutter of the pixel by the side of the leftmost in drawing 35 opens, the shutter of the 2nd pixel opens the ingredients F04/v of the foreground of the first shutter time/v from the left in drawing 35, and it is equal to the ingredient of the foreground corresponding to the 2nd shutter time / v. Similarly, the shutter of the 3rd pixel opens

the ingredients F04/v of a foreground from the left in drawing 35, and the shutter of the 4th pixel opens them from the ingredient of the foreground corresponding to the 3rd shutter time / v, and the left in drawing 35, and they are equal to the ingredient of the foreground corresponding to the 4th shutter time / v respectively.

[0143]Since it moves in this way and the field of the foreground corresponding to the object which is moving contains a Japanese quince, it can also be said to be a distortion area.

[0144]Drawing 36 is the model figure which developed the pixel value of the pixel on one line to the time direction, including an uncovered background region in case a foreground moves toward the right-hand side in a figure. In drawing 36, movement quantity v of a foreground is 4. Since one frame is short time, the object corresponding to a foreground is a rigid body, and it can be assumed that it is moving at uniform velocity. In drawing 36, the picture of the object corresponding to a foreground moves to right-hand side by 4 pixels in the following frame on the basis of a certain frame.

[0145]In drawing 36, the 4th pixel belongs to a background region from the pixel thru/or the left of most left-hand side. In drawing 36, the left to the 5th thru/or the 7th pixel belong to the mixing zone which is an uncovered background from the left. In drawing 36, the pixel of most right-hand side belongs to a foreground region.

[0146]Since it is moving so that the object corresponding to the foreground which had covered the object corresponding to a background may be removed from before the object corresponding to a background with the passage of time, When the ingredient contained in the pixel value of the pixel belonging to an uncovered background region has a period corresponding to shutter time, it is replaced with the ingredient of a background from the ingredient of a foreground.

[0147]For example, pixel value M' which attached the thick line frame in drawing 36 is expressed with a formula (2).

[0148]

M'=F02/v+F01/v+B26/v+B26/v (2)

[0149]For example, since the 5th pixel contains the ingredient of the foreground corresponding to one shutter time / v including the ingredient of the background corresponding to three shutter time / v from the left, the mixture ratio alpha of the 5th pixel is 3/4 from the left. Since the 6th pixel contains the ingredient of the foreground corresponding to two shutter time / v including the ingredient of the background corresponding to two shutter time / v from the left, the mixture ratio alpha of the 6th pixel is 1/2 from the left. Since the 7th pixel contains the ingredient of the foreground corresponding to three shutter time / v including the ingredient of the background corresponding to one shutter time / v from the left, the mixture ratio alpha of the 7th pixel is 1/4 from the left.

[0150]When a formula (1) and a formula (2) are generalized more, the pixel value M is

expressed with a formula (3).

[0151]

[Equation 1]

$$M = \alpha \cdot B + \sum_i Fi/v \qquad (3)$$

Here, alpha is the mixture ratio. B is a pixel value of a background and Fi/v is an ingredient of a foreground.

[0152]The object corresponding to a foreground is a rigid body, and can assume that it moves at uniform velocity, and since movement quantity v is 4, For example, the shutter of the 5th pixel opens from the left in drawing 36, the shutter of the 6th pixel opens the first ingredients F01/v of the foreground of shutter time/v from the left in drawing 36, and it is equal to the ingredient of the foreground corresponding to the 2nd shutter time / v. Similarly, the shutter of the 7th pixel opens F01/v from the left in drawing 36, and the shutter of the 8th pixel opens it from the ingredient of the foreground corresponding to the 3rd shutter time / v, and the left in drawing 36, and it is equal to the ingredient of the foreground corresponding to the 4th shutter time / v respectively.

[0153]An object corresponding to a foreground is a rigid body, and can assume that it moves at uniform velocity, and since the virtual number of partitions is 4, For example, a shutter of the 6th pixel opens from the left in drawing 36, a shutter of the 7th pixel opens the first ingredients F02/v of a foreground of shutter time/v from the left in drawing 36, and it is equal to an ingredient of a foreground corresponding to the 2nd shutter time / v. Similarly, a shutter of the 8th pixel opens the ingredients F02/v of a foreground from the left in drawing 36, and they are equal to an ingredient of a foreground corresponding to the 3rd shutter time / v.

[0154]An object corresponding to a foreground is a rigid body, and can assume that it moves at uniform velocity, and since movement quantity v is 4, For example, a shutter of the 7th pixel opens from the left in drawing 36, a shutter of the 8th pixel opens the first ingredients F03/v of a foreground of shutter time/v from the left in drawing 36, and it is equal to an ingredient of a foreground corresponding to the 2nd shutter time / v.

[0155]In explanation of drawing 34 thru/or drawing 36, although it was explained that the virtual number of partitions was 4, the virtual number of partitions corresponds to movement quantity v. Generally movement quantity v corresponds to movement speed of an object corresponding to a foreground. For example, while moving so that an object corresponding to a foreground may be displayed on right-hand side by 4 pixels in the following frame on the basis of a certain frame, movement quantity v is set to 4. Corresponding to movement quantity v, the virtual number of partitions is set to 4. While similarly moving, for example so that an object corresponding to a

foreground may be displayed on left-hand side by 6 pixels in the following frame on the basis of a certain frame, movement quantity v is set to 6 and the virtual number of partitions is set to 6.

[0156]Relation between a mixing zone which comprises a foreground region, a background region and a covered background region which were explained to drawing 37 and drawing 38 above, or an uncovered background region, and an ingredient of a foreground corresponding to divided shutter time and an ingredient of a background is shown.

[0157]Drawing 37 shows an example which extracted a pixel of a foreground region, a background region, and a mixing zone from a picture including a foreground corresponding to an object which is moving in a stationary background front. In an example shown in drawing 37, an object corresponding to a foreground is moving horizontally to a screen.

[0158]Frame #n+1 is the next frame of frame #n, and frame #n+2 is the next frame of frame #n+1.

[0159]A pixel of a foreground region, a background region, and a mixing zone which were extracted from either of frame #n thru/or frame #n+2 is extracted, movement quantity v is set to 4, and a model which developed a pixel value of an extracted pixel to a time direction is shown in drawing 38.

[0160]Since an object corresponding to a foreground moves, a pixel value of a foreground region comprises an ingredient of four different foregrounds corresponding to a period of shutter time/v. For example, a pixel located most in left-hand side among pixels of a foreground region shown in drawing 38 comprises F01/v, F02/v, F03/v, and F04/v. That is, a pixel of a foreground region moves and contains a Japanese quince.

[0161]Since an object corresponding to a background is standing it still, in a period corresponding to shutter time, light corresponding to a background inputted into the sensor 76a does not change. In this case, a pixel value of a background region moves and does not contain a Japanese quince.

[0162]A pixel value of a pixel belonging to a mixing zone which comprises a covered background region or an uncovered background region comprises an ingredient of a foreground, and an ingredient of a background.

[0163]Next, while a picture corresponding to an object is moving, it is the pixel in two or more frames adjacently located in a line with one row, and a model which developed a pixel value of a pixel of the same position to a time direction on a frame is explained. For example, while a picture corresponding to an object is moving horizontally to a screen, a pixel located in a line on one line of a screen can be chosen as a pixel adjacently located in a line with one row.

[0164]Drawing 39 is a pixel which three frames of a picture which picturized an object corresponding to a stationary background adjoined, and has been located in a line with

one row, and is the model figure which developed a pixel value of a pixel of the same position to a time direction on a frame. Frame #n is the next frame of frame #n-1, and frame #n+1 is the next frame of frame #n. Other frames are called similarly.

[0165]A pixel value of B01 thru/or B12 which are shown in drawing 39 is a pixel value of a pixel corresponding to a stationary object of a background. Since an object corresponding to a background is standing it still, a pixel value of a corresponding pixel does not change in frame #n-1 thru/or the frame n+1. For example, a pixel in frame #n corresponding to a position of a pixel which has a pixel value of B05 in frame #n-1, and a pixel in frame #n+1 have a pixel value of B05, respectively.

[0166]Drawing 40 is a pixel which three frames of a picture which picturized an object corresponding to a foreground moved to right-hand side in a figure adjoined, and has been located in a line with one row with an object corresponding to a stationary background, and is the model figure which developed a pixel value of a pixel of the same position to a time direction on a frame. A model shown in drawing 40 includes a covered background region.

[0167]In drawing 40, since it moves so that an object corresponding to a foreground may be a rigid body, and can assume that it moves at uniform velocity and a picture of a foreground may be displayed on 4-pixel right-hand side in the following frame, movement quantity v of a foreground is 4 and the virtual number of partitions is 4.

[0168]For example, a shutter of a pixel by the side of the leftmost of frame #n-1 in drawing 40 opens, an ingredient of a foreground of the first shutter time/v is set to F12/v, a shutter of the 2nd pixel opens it from the left in drawing 40, and an ingredient of the 2nd foreground of shutter time/v is also set to F12/v. A shutter of the 3rd pixel opens from the left in drawing 40, a shutter of the 4th pixel opens from an ingredient of the 3rd foreground of shutter time/v, and the left in drawing 40, and an ingredient of the 4th foreground of shutter time/v is set to F12/v.

[0169]A shutter of a pixel by the side of the leftmost of frame #n-1 in drawing 40 opens, an ingredient of the 2nd foreground of shutter time/v is set to F11/v, a shutter of the 2nd pixel opens it from the left in drawing 40, and an ingredient of the 3rd foreground of shutter time/v is also set to F11/v. A shutter of the 3rd pixel opens from the left in drawing 40, and an ingredient of the 4th foreground of shutter time/v is set to F11/v.

[0170]A shutter of a pixel by the side of the leftmost of frame #n-1 in drawing 40 opens, an ingredient of the 3rd foreground of shutter time/v is set to F10/v, a shutter of the 2nd pixel opens it from the left in drawing 40, and an ingredient of the 4th foreground of shutter time/v is also set to F10/v. A shutter of a pixel by the side of the leftmost of frame #n-1 in drawing 40 opens, and an ingredient of the 4th foreground of shutter time/v is set to F09/v.

[0171]Since an object corresponding to a background is standing it still, a shutter of the 2nd pixel opens from the left of frame #n-1 in drawing 40, and an ingredient of the

background of the first shutter time/v is set to B01/v. A shutter of the 3rd pixel opens from the left of frame #n-1 in drawing 40, and an ingredient of the background of the beginning and the 2nd shutter time / v is set to B02/v. A shutter of the 4th pixel opens from the left of frame #n-1 in drawing 40, and an ingredient of the background of the beginning thru/or the 3rd shutter time / v is set to B03/v.

[0172]In frame #n-1 in drawing 40, a pixel of most left-hand side belongs to a foreground region, and the 2nd thru/or the 4th pixel belong to a mixing zone which is a covered background region from left-hand side.

[0173]The 5th pixel thru/or the 12th pixel belong to a background region from the left of frame #n-1 in drawing 40, and the pixel value is set to B04 thru/or B11, respectively.

[0174]The 1st pixel thru/or the 5th pixel belong to a foreground region from the left of frame #n in drawing 40. Ingredients of a foreground of the shutter time/v in a foreground region of frame #n are either F05/v thru/or F12/v.

[0175]Since it moves so that an object corresponding to a foreground may be a rigid body, and can assume that it moves at uniform velocity and a picture of a foreground may be displayed on 4-pixel right-hand side in the following frame, A shutter of the 5th pixel opens from the left of frame #n in drawing 40, an ingredient of a foreground of the first shutter time/v is set to F12/v, a shutter of the 6th pixel opens it from the left in drawing 40, and an ingredient of the 2nd foreground of shutter time/v is also set to F12/v. A shutter of the 7th pixel opens from the left in drawing 40, a shutter of the 8th pixel opens from an ingredient of the 3rd foreground of shutter time/v, and the left in drawing 40, and an ingredient of the 4th foreground of shutter time/v is set to F12/v.

[0176]A shutter of the 5th pixel opens from the left of frame #n in drawing 40, an ingredient of the 2nd foreground of shutter time/v is set to F11/v, a shutter of the 6th pixel opens it from the left in drawing 40, and an ingredient of the 3rd foreground of shutter time/v is also set to F11/v. A shutter of the 7th pixel opens from the left in drawing 40, and an ingredient of the 4th foreground of shutter time/v is set to F11/v.

[0177]A shutter of the 5th pixel opens from the left of frame #n in drawing 40, an ingredient of the 3rd foreground of shutter time/v is set to F10/v, a shutter of the 6th pixel opens it from the left in drawing 40, and an ingredient of the 4th foreground of shutter time/v is also set to F10/v. A shutter of the 5th pixel opens from the left of frame #n in drawing 40, and an ingredient of the 4th foreground of shutter time/v is set to F09/v.

[0178]Since an object corresponding to a background is standing it still, a shutter of the 6th pixel opens from the left of frame #n in drawing 40, and an ingredient of the background of the first shutter time/v is set to B05/v. A shutter of the 7th pixel opens from the left of frame #n in drawing 40, and an ingredient of the background of the beginning and the 2nd shutter time / v is set to B06/v. A shutter of the 8th pixel opens from the left of frame #n in drawing 40, and an ingredient of the background of

the beginning thru/or the 3rd shutter time / v is set to B07/v.

[0179]In frame #n in drawing 40, the 6th thru/or the 8th pixel belong to a mixing zone which is a covered background region from left-hand side.

[0180]The 9th pixel thru/or the 12th pixel belong to a background region from the left of frame #n in drawing 40, and a pixel value is set to B08 thru/or B11, respectively.

[0181]The 1st pixel thru/or the 9th pixel belong to a foreground region from the left of frame #n+1 in drawing 40. Ingredients of a foreground of the shutter time/v in a foreground region of frame #n+1 are either F01/v thru/or F12/v.

[0182]Since it moves so that an object corresponding to a foreground may be a rigid body, and can assume that it moves at uniform velocity and a picture of a foreground may be displayed on 4-pixel right-hand side in the following frame, A shutter of the 9th pixel opens from the left of frame #n+1 in drawing 40, an ingredient of a foreground of the first shutter time/v is set to F12/v, a shutter of the 10th pixel opens it from the left in drawing 40, and an ingredient of the 2nd foreground of shutter time/v is also set to F12/v. A shutter of the 11th pixel opens from the left in drawing 40, a shutter of the 12th pixel opens from an ingredient of the 3rd foreground of shutter time/v, and the left in drawing 40, and an ingredient of the 4th foreground of shutter time/v is set to F12/v.

[0183]A shutter of the 9th pixel opens from the left of frame #n+1 in drawing 40, an ingredient of a foreground of the 2nd period of shutter time/v is set to F11/v, a shutter of the 10th pixel opens it from the left in drawing 40, and an ingredient of the 3rd foreground of shutter time/v is also set to F11/v. A shutter of the 11th pixel opens from the left in drawing 40, and an ingredient of the 4th foreground of shutter time/v is set to F11/v.

[0184]A shutter of the 9th pixel opens from the left of frame #n+1 in drawing 40, an ingredient of the 3rd foreground of shutter time/v is set to F10/v, a shutter of the 10th pixel opens it from the left in drawing 40, and an ingredient of the 4th foreground of shutter time/v is also set to F10/v. A shutter of the 9th pixel opens from the left of frame #n+1 in drawing 40, and an ingredient of the 4th foreground of shutter time/v is set to F09/v.

[0185]Since an object corresponding to a background is standing it still, a shutter of the 10th pixel opens from the left of frame #n+1 in drawing 40, and an ingredient of the background of the first shutter time/v is set to B09/v. A shutter of the 11th pixel opens from the left of frame #n+1 in drawing 40, and an ingredient of the background of the beginning and the 2nd shutter time / v is set to B10/v. A shutter of the 12th pixel opens from the left of frame #n+1 in drawing 40, and an ingredient of the background of the beginning thru/or the 3rd shutter time / v is set to B11/v.

[0186]In frame #n+1 in drawing 40, the 10th thru/or the 12th pixel correspond to a mixing zone which is a covered background region from left-hand side.

[0187]Drawing 41 is a model figure of a picture which extracted an ingredient of a

foreground from a pixel value shown in drawing 40.

[0188]Drawing 42 is a pixel which three frames of a picture which picturized a foreground corresponding to an object which moves to right-hand side in a figure adjoined, and has been located in a line with one row with a stationary background, and is the model figure which developed a pixel value of a pixel of the same position to a time direction on a frame. An uncovered background region is included in drawing 42.

[0189]In drawing 42, it can be assumed that an object corresponding to a foreground is a rigid body, and is moving at uniform velocity. Since an object corresponding to a foreground is moving so that it may be displayed on right-hand side by 4 pixels in the following frame, movement quantity v is 4.

[0190]For example, a shutter of a pixel by the side of the leftmost of frame #n-1 in drawing 42 opens, the first ingredient of a foreground of shutter time/v is set to F13/v, a shutter of the 2nd pixel opens it from the left in drawing 42, and an ingredient of the 2nd foreground of shutter time/v is also set to F13/v. A shutter of the 3rd pixel opens from the left in drawing 42, a shutter of the 4th pixel opens from an ingredient of the 3rd foreground of shutter time/v, and the left in drawing 42, and an ingredient of the 4th foreground of shutter time/v is set to F13/v.

[0191]A shutter of the 2nd pixel opens from the left of frame #n-1 in drawing 42, an ingredient of a foreground of the first shutter time/v is set to F14/v, a shutter of the 3rd pixel opens it from the left in drawing 42, and an ingredient of the 2nd foreground of shutter time/v is also set to F14/v. A shutter of the 3rd pixel opens from the left in drawing 42, and the first ingredient of a foreground of shutter time/v is set to F15/v.

[0192]Since an object corresponding to a background is standing it still, a shutter of a pixel by the side of the leftmost of frame #n-1 in drawing 42 opens, and an ingredient of the 2nd thru/or the 4th background of shutter time/v is set to B25/v. A shutter of the 2nd pixel opens from the left of frame #n-1 in drawing 42, and an ingredient of the 3rd and the 4th background of shutter time/v is set to B26/v. A shutter of the 3rd pixel opens from the left of frame #n-1 in drawing 42, and an ingredient of the 4th background of shutter time/v is set to B27/v.

[0193]In frame #n-1 in drawing 42, a pixel of most left-hand side thru/or the 3rd pixel belong to a mixing zone which is an uncovered background region.

[0194]The 4th pixel thru/or the 12th pixel belong to a foreground region from the left of frame #n-1 in drawing 42. Ingredients of a foreground of a frame are either F13/v thru/or F24/v.

[0195]The 4th pixel belongs to a background region from a pixel thru/or the left by the side of the leftmost of frame #n in drawing 42, and a pixel value is set to B25 thru/or B28, respectively.

[0196]Since it moves so that an object corresponding to a foreground may be a rigid body, and can assume that it moves at uniform velocity and a picture of a foreground may be displayed on 4-pixel right-hand side in the following frame, A shutter of the

5th pixel opens from the left of frame #n in drawing 42, an ingredient of a foreground of the first shutter time/v is set to F13/v, a shutter of the 6th pixel opens it from the left in drawing 42, and an ingredient of the 2nd foreground of shutter time/v is also set to F13/v. A shutter of the 7th pixel opens from the left in drawing 42, a shutter of the 8th pixel opens from an ingredient of the 3rd foreground of shutter time/v, and the left in drawing 42, and an ingredient of the 4th foreground of shutter time/v is set to F13/v.

[0197]A shutter of the 6th pixel opens from the left of frame #n in drawing 42, an ingredient of a foreground of the first shutter time/v is set to F14/v, a shutter of the 7th pixel opens it from the left in drawing 42, and an ingredient of the 2nd foreground of shutter time/v is also set to F14/v. A shutter of the 8th pixel opens from the left in drawing 42, and an ingredient of a foreground of the first shutter time/v is set to F15/v.

[0198]Since an object corresponding to a background is standing it still, a shutter of the 5th pixel opens from the left of frame #n in drawing 42, and an ingredient of the 2nd thru/or the 4th background of shutter time/v is set to B29/v. A shutter of the 6th pixel opens from the left of frame #n in drawing 42, and an ingredient of the 3rd and the 4th background of shutter time/v is set to B30/v. A shutter of the 7th pixel opens from the left of frame #n in drawing 42, and an ingredient of the 4th background of shutter time/v is set to B31/v.

[0199]In frame #n in drawing 42, the 5th pixel thru/or the 7th pixel belong to a mixing zone which is an uncovered background region from the left.

[0200]The 8th pixel thru/or the 12th pixel belong to a foreground region from the left of frame #n in drawing 42. Values corresponding to a period of shutter time/v in a foreground region of frame #n are either F13/v thru/or F20/v.

[0201]The 8th pixel belongs to a background region from a pixel thru/or the left by the side of the leftmost of frame #n+1 in drawing 42, and a pixel value is set to B25 thru/or B32, respectively.

[0202]Since it moves so that an object corresponding to a foreground may be a rigid body, and can assume that it moves at uniform velocity and a picture of a foreground may be displayed on 4-pixel right-hand side in the following frame, A shutter of the 9th pixel opens from the left of frame #n+1 in drawing 42, an ingredient of a foreground of the first shutter time/v is set to F13/v, a shutter of the 10th pixel opens it from the left in drawing 42, and an ingredient of the 2nd foreground of shutter time/v is also set to F13/v. A shutter of the 11th pixel opens from the left in drawing 42, a shutter of the 12th pixel opens from an ingredient of the 3rd foreground of shutter time/v, and the left in drawing 42, and an ingredient of the 4th foreground of shutter time/v is set to F13/v.

[0203]A shutter of the 10th pixel opens from the left of frame #n+1 in drawing 42, an ingredient of a foreground of the first shutter time/v is set to F14/v, a shutter of the 11th pixel opens it from the left in drawing 42, and an ingredient of the 2nd foreground

of shutter time/v is also set to F14/v. A shutter of the 12th pixel opens from the left in drawing 42, and an ingredient of a foreground of the first shutter time/v is set to F15/v.

[0204]Since an object corresponding to a background is standing it still, a shutter of the 9th pixel opens from the left of frame #n+1 in drawing 42, and an ingredient of the 2nd thru/or the 4th background of shutter time/v is set to B33/v. A shutter of the 10th pixel opens from the left of frame #n+1 in drawing 42, and an ingredient of the 3rd and the 4th background of shutter time/v is set to B34/v. A shutter of the 11th pixel opens from the left of frame #n+1 in drawing 42, and an ingredient of the 4th background of shutter time/v is set to B35/v.

[0205]In frame #n+1 in drawing 42, the 9th pixel thru/or the 11th pixel belong to a mixing zone which is an uncovered background region from the left.

[0206]The 12th pixel belongs to a foreground region from the left of frame #n+1 in drawing 42. Ingredients of a foreground of the shutter time/v in a foreground region of frame #n+1 are either F13/v thru/or F16/v.

[0207]Drawing 43 is a model figure of a picture which extracted an ingredient of a foreground from a pixel value shown in drawing 42.

[0208]Return to drawing 27 and a pixel value of two or more frames is used for the field specific part 103, A flag which shows that it belongs to a foreground region, a background region, a covered background region, or an uncovered background region is matched for every pixel, and the mixture ratio calculation part 104 and the motion dotage controller 106 are supplied as area information.

[0209]the mixture ratio which the mixture ratio calculation part 104 computed the mixture ratio alpha for every pixel about a pixel contained in a mixing zone based on a pixel value of two or more frames, and area information, and was computed -- alpha is supplied to the foreground background separation part 105.

[0210]the foreground background separation part 105 -- a pixel value of two or more frames, area information, and the mixture ratio -- extracting a foreground ingredient picture which consists only of an ingredient of a foreground based on alpha -- a motion -- a Japanese quince -- the controller 106 is supplied.

[0211]A foreground ingredient picture to which the motion dotage controller 106 was supplied from the foreground background separation part 105, A foreground ingredient picture which was included in a foreground ingredient picture, moved based on a motion vector supplied from the motion detection part 102 and area information supplied from the field specific part 103, adjusted quantity of a Japanese quince, moved, and adjusted quantity of a Japanese quince is outputted.

[0212]With reference to a flow chart of drawing 44, processing of adjustment of quantity by the separation server 11 which moves and fades is explained. In Step S11, the field specific part 103 performs processing of field specification which generates area information which shows whether it belongs for every pixel of an inputted image

to either a foreground region, a background region, a covered background region or an uncovered background region based on an inputted image. Details of processing of field specification are mentioned later. The field specific part 103 supplies generated area information to the mixture ratio calculation part 104.

[0213]In Step S11, the field specific part 103, It may be made to generate area information which shows whether it belongs for every pixel of an inputted image to either a foreground region, a background region or a mixing zone (distinction of a covered background region or an uncovered background region is not carried out) based on an inputted image. In this case, the foreground background separation part 105 and the motion dotage controller 106 judge whether a mixing zone is a covered background region or it is an uncovered background region based on the direction of a motion vector. For example, when having ranked with a foreground region, a mixing zone and a background region, and order corresponding to the direction of a motion vector, the mixing zone, When it is judged with a covered background region and has ranked with a background region, a mixing zone and a foreground region, and order corresponding to the direction of a motion vector, the mixing zone is judged to be an uncovered background region.

[0214]In Step S12, the mixture ratio calculation part 104 computes the mixture ratio alpha for every pixel contained in a mixing zone based on an inputted image and area information. Details of processing of mixture ratio calculation are mentioned later. the mixture ratio which the mixture ratio calculation part 104 computed -- alpha is supplied to the foreground background separation part 105.

[0215]in Step S13 -- the foreground background separation part 105 -- area information and the mixture ratio -- based on alpha, an ingredient of a foreground is extracted from an inputted image, it moves as a foreground ingredient picture, and the Japanese quince controller 106 is supplied.

[0216]In Step S14, move and the Japanese quince controller 106, It is the continuous pixel located in a line in the motion direction based on a motion vector and area information, A batch which shows a position on a picture of a thing belonging to either an uncovered background region, a foreground region and a covered background region is generated, and it is contained in a foreground ingredient corresponding to a batch, and moves, and quantity of a Japanese quince is adjusted. Details of processing of adjustment of quantity of motion dotage are mentioned later.

[0217]In Step S15, the separation server 11 judges whether processing was ended about the whole screen, and when judged with not having ended processing about the whole screen, it progresses to Step S14 and it repeats processing of adjustment of quantity which moves and fades for an ingredient of a foreground corresponding to a batch.

[0218]In Step S15, when judged with having ended processing about the whole screen, processing is ended.

[0219]Thus, the separation server 11 separates a foreground and a background, can be contained in a foreground, can be moved, and can adjust quantity of a Japanese quince. That is, the separation server 11 can be contained in sample data which is a pixel value of a pixel of a foreground, can be moved, and can adjust quantity of a Japanese quince.

[0220]Hereafter, each composition of the field specific part 103, the mixture ratio calculation part 104, the foreground background separation part 105, and the motion dotage controller 106 is explained.

[0221]Drawing 45 is a block diagram showing an example of composition of the field specific part 103. The field specific part 103 which shows drawing 45 composition does not use a motion vector. The frame memory 201 memorizes an inputted picture per frame. Frame #n-1, frame #n whose frame memory 201 is a frame in front of [of frame #n-2 which is a frame in front of / of frame #n / two, and frame #n] one when an object of processing is frame #n, Frame #n+2 which is a frame after two, frame #n+1 which is a frame after [of frame #n] one, and frame #n, is memorized.

[0222]A pixel value of a pixel of frame #n+2 in the same position as a position on a picture of a pixel which is an object of field specification [the static/dynamic detection portion 202-1] of frame #n, And an absolute value of a difference of a read pixel value is computed by reading a pixel value of a pixel of frame #n+1 in the same position as a position on a picture of a pixel which is an object of field specification of frame #n from the frame memory 201. It judges whether the static/dynamic detection portion 202-1 has an absolute value of a difference of a pixel value of frame #n+2, and a pixel value of frame #n+1 larger than threshold Th set up beforehand, and when judged with an absolute value of a difference being larger than threshold Th, static/dynamic detection which shows a motion is supplied to the area judgment part 203-1. When judged with an absolute value of a difference of a pixel value of a pixel of frame #n+2 and a pixel value of a pixel of frame #n+1 being below threshold Th, the static/dynamic detection portion 202-1 supplies static/dynamic detection which shows stillness to the area judgment part 203-1.

[0223]The static/dynamic detection portion 202-2 computes an absolute value of a difference of a pixel value by reading a pixel value of a pixel of frame #n+1 in the same position as a position on a picture of a pixel which is an object of field specification of frame #n, and a pixel value of a pixel which is the target of frame #n from the frame memory 201. The static/dynamic detection portion 202-2 an absolute value of a difference of a pixel value of frame #n+1 and a pixel value of frame #n, When it judges whether it is larger than threshold Th set up beforehand and judges that an absolute value of a difference of a pixel value is larger than threshold Th, static/dynamic detection which shows a motion is supplied to the area judgment part 203-1 and the area judgment part 203-2. When it judges that an absolute value of a difference of a pixel value of a pixel of frame #n+1 and a pixel value of a pixel of frame #n is below

threshold Th, the static/dynamic detection portion 202-2 supplies static/dynamic detection which shows stillness to the area judgment part 203-1 and the area judgment part 203-2.

[0224]The static/dynamic detection portion 202-3 computes an absolute value of a difference of a pixel value by reading a pixel value of a pixel of frame #n-1 in the same position as a position on a pixel value of a pixel which is an object of field specification of frame #n, and a picture of a pixel which is an object of field specification of frame #n from the frame memory 201. The static/dynamic detection portion 202-3 an absolute value of a difference of a pixel value of frame #n and a pixel value of frame #n-1, When it judges whether it is larger than threshold Th set up beforehand and judges that an absolute value of a difference of a pixel value is larger than threshold Th, static/dynamic detection which shows a motion is supplied to the area judgment part 203-2 and the area judgment part 203-3. When it judges that an absolute value of a difference of a pixel value of a pixel of frame #n and a pixel value of a pixel of frame #n-1 is below threshold Th, the static/dynamic detection portion 202-3 supplies static/dynamic detection which shows stillness to the area judgment part 203-2 and the area judgment part 203-3.

[0225]A pixel value of a pixel of frame #n-1 in the same position as a position on a picture of a pixel which is an object of field specification [the static/dynamic detection portion 202-4] of frame #n, And an absolute value of a difference of a pixel value is computed by reading a pixel value of a pixel of frame #n-2 in the same position as a position on a picture of a pixel which is an object of field specification of frame #n from the frame memory 201. The static/dynamic detection portion 202-4 an absolute value of a difference of a pixel value of frame #n-1 and a pixel value of frame #n-2, When it judges whether it is larger than threshold Th set up beforehand and judges that an absolute value of a difference of a pixel value is larger than threshold Th, static/dynamic detection which shows a motion is supplied to the area judgment part 203-3. When it judges that an absolute value of a difference of a pixel value of a pixel of frame #n-1 and a pixel value of a pixel of frame #n-2 is below threshold Th, the static/dynamic detection portion 202-4 supplies static/dynamic detection which shows stillness to the area judgment part 203-3.

[0226]When static/dynamic detection with which static/dynamic detection supplied from the static/dynamic detection portion 202-1 showed stillness, and the area judgment part 203-1 was supplied from the static/dynamic detection portion 202-2 shows a motion, "1" which shows that it belongs to an uncovered background region is set as an uncovered background region decision flag corresponding to a pixel judge [pixel] with a pixel which is an object of field specification in frame #n belonging to an uncovered background region, and a field is judged to be.

[0227]The area judgment part 203-1. [whether static/dynamic detection supplied from the static/dynamic detection portion 202-1 shows a motion, and] Or when

static/dynamic detection supplied from the static/dynamic detection portion 202-2 shows stillness, "0" which shows not belonging to an uncovered background region is set as an uncovered background region decision flag corresponding to a pixel judge [pixel] with a pixel which is an object of field specification in frame #n not belonging to an uncovered background region, and a field is judged to be.

[0228]The area judgment part 203-1 supplies an uncovered background region decision flag with which "1" or "0" was set up in this way to the decision flag storing frame memory 204.

[0229]When static/dynamic detection with which static/dynamic detection supplied from the static/dynamic detection portion 202-2 showed stillness, and the area judgment part 203-2 was supplied from the static/dynamic detection portion 202-3 shows stillness, "1" which shows that it belongs to a static region is set as a static region decision flag corresponding to a pixel judge [pixel] with a pixel which is an object of field specification in frame #n belonging to a static region, and a field is judged to be.

[0230]The area judgment part 203-2. [whether static/dynamic detection supplied from the static/dynamic detection portion 202-2 shows a motion, and] Or when static/dynamic detection supplied from the static/dynamic detection portion 202-3 shows a motion, "0" which shows not belonging to a static region is set as a static region decision flag corresponding to a pixel judge [pixel] with a pixel which is an object of field specification in frame #n not belonging to a static region, and a field is judged to be.

[0231]The area judgment part 203-2 supplies a static region decision flag with which "1" or "0" was set up in this way to the decision flag storing frame memory 204.

[0232]When static/dynamic detection with which static/dynamic detection supplied from the static/dynamic detection portion 202-2 showed a motion, and the area judgment part 203-2 was supplied from the static/dynamic detection portion 202-3 shows a motion, "1" which shows that it belongs to a motion field is set as a motion area judgment flag corresponding to a pixel a pixel which is an object of field specification in frame #n moves, and judge [pixel] with belonging to a field and with which a field is judged to be.

[0233]The area judgment part 203-2. [whether static/dynamic detection supplied from the static/dynamic detection portion 202-2 shows stillness, and] Or when static/dynamic detection supplied from the static/dynamic detection portion 202-3 shows stillness, "0" which shows not belonging to a motion field is set as a motion area judgment flag corresponding to a pixel a pixel which is an object of field specification in frame #n moves, and judge [pixel] with not belonging to a field and with which a field is judged to be.

[0234]The area judgment part 203-2 supplies a motion area judgment flag with which "1" or "0" was set up in this way to the decision flag storing frame memory 204.

[0235]When static/dynamic detection with which static/dynamic detection supplied from the static/dynamic detection portion 202-3 showed a motion, and the area judgment part 203-3 was supplied from the static/dynamic detection portion 202-4 shows stillness, "1" which shows that it belongs to a covered background region is set as a covered background region decision flag corresponding to a pixel judge [pixel] with a pixel which is an object of field specification in frame #n belonging to a covered background region, and a field is judged to be.

[0236]The area judgment part 203-3. [whether static/dynamic detection supplied from the static/dynamic detection portion 202-3 shows stillness, and] Or when static/dynamic detection supplied from the static/dynamic detection portion 202-4 shows a motion, "0" which shows not belonging to a covered background region is set as a covered background region decision flag corresponding to a pixel judge [pixel] with a pixel which is an object of field specification in frame #n not belonging to a covered background region, and a field is judged to be.

[0237]The area judgment part 203-3 supplies a covered background region decision flag with which "1" or "0" was set up in this way to the decision flag storing frame memory 204.

[0238]An uncovered background region decision flag with which the decision flag storing frame memory 204 was supplied from the area judgment part 203-1, A static region decision flag supplied from the area judgment part 203-2, a motion area judgment flag supplied from the area judgment part 203-2, and a covered background region decision flag supplied from the area judgment part 203-3 are memorized, respectively.

[0239]The decision flag storing frame memory 204 supplies a memorized uncovered background region decision flag, a static region decision flag, a motion area judgment flag, and a covered background region decision flag to the synchronizer 205. . The synchronizer 205 was supplied from the decision flag storing frame memory 204. An uncovered background region decision flag, a static region decision flag, Based on a motion area judgment flag and a covered background region decision flag, Each pixel generates area information which shows that it belongs to either an uncovered background region, a static region, a motion field and a covered background region, and supplies the decision flag storing frame memory 206.

[0240]The decision flag storing frame memory 206 memorizes area information supplied from the synchronizer 205, and it outputs memorized area information.

[0241]Next, an example of processing of the field specific part 103 is explained with reference to drawing 46 thru/or drawing 50.

[0242]While an object corresponding to a foreground is moving, a position on a screen of a picture corresponding to an object changes for every frame. As shown in drawing 46, in frame #n, a picture corresponding to an object located in a position shown by Yn (x, y) is located in Yn+1 (x, y) in frame #n+1 which is the following frame.

[0243]A model figure which developed a pixel value of a pixel which adjoins in the motion direction of a picture corresponding to an object of a foreground, and is located in a line with one row to a time direction is shown in drawing 22. For example, a model figure [in / when level / to a screen / in the motion direction of a picture corresponding to an object of a foreground / drawing 47] shows a model which developed a pixel value of an adjoining pixel on one line to a time direction.

[0244]In drawing 47, a line in frame #n is the same as a line in frame #n+1.

[0245]In frame #n, an ingredient of a foreground corresponding to an object contained in the 2nd pixel thru/or the 13th pixel from the left is contained in the 6th thru/or the 17th pixel from the left in frame #n+1.

[0246]In frame #n, pixels belonging to a covered background region are the 11th thru/or the 13th pixel from the left, and pixels belonging to an uncovered background region are the 2nd thru/or the 4th pixel from the left. In frame #n+1, pixels belonging to a covered background region are the 15th thru/or the 17th pixel from the left, and pixels belonging to an uncovered background region are the 6th thru/or the 8th pixel from the left.

[0247]In an example shown in drawing 47, since 4 pixels of ingredients of a foreground included in frame #n are moving in frame #n+1, movement quantity v is 4. The virtual number of partitions corresponds to movement quantity v, and is 4.

[0248]Next, change of a pixel value of a pixel belonging to a mixing zone before and behind a frame currently observed is explained.

[0249]In frame #n which is shown in drawing 48 and whose movement quantity v of a foreground a background stands it still and is 4, pixels belonging to a covered background region are the 15th thru/or the 17th pixel from the left. Since movement quantity v is 4, in frame #n-1 in front of one, the 15th thru/or the 17th pixel belong to a background region only including an ingredient of a background from the left. In frame #n-2 in front of one, the 15th thru/or the 17th pixel belong to a background region only including an ingredient of a background from the left.

[0250]Since an object corresponding to a background is standing it still here, a pixel value of the left of frame #n-1 to the 15th pixel does not change from a pixel value of the left of frame #n-2 to the 15th pixel. Similarly, a pixel value of the left of frame #n-1 to the 16th pixel does not change from a pixel value of the left of frame #n-2 to the 16th pixel, and a pixel value of the left of frame #n-1 to the 17th pixel does not change from a pixel value of the left of frame #n-2 to the 17th pixel.

[0251]That is, since a pixel of frame #n-1 corresponding to a pixel belonging to a covered background region in frame #n and frame #n-2 comprises only an ingredient of a background and a pixel value does not change, an absolute value of the difference turns into about 0 value. Therefore, static/dynamic detection to a pixel of frame #n-1 corresponding to a pixel belonging to a mixing zone in frame #n and frame #n-2 is judged by the static/dynamic detection portion 202-4 to be stillness.

[0252]Since a pixel belonging to a covered background region in frame #n contains an ingredient of a foreground, a pixel value differs from a case where only an ingredient of a background in frame #n−1 is comprised. Therefore, static/dynamic detection to a pixel belonging to a mixing zone in frame #n and a pixel of corresponding frame #n−1 is judged by the static/dynamic detection portion 202−3 to be a motion.

[0253]Thus, the area judgment part 203−3 judges with a corresponding pixel belonging to a covered background region, when a result of static/dynamic detection which shows static/dynamic detection portion 202−3 lost motion is supplied and a result of static/dynamic detection which shows stillness from the static/dynamic detection portion 202−4 is supplied.

[0254]In frame #n which is shown in drawing 49 and whose movement quantity v of a foreground a background stands it still and is 4, pixels contained in an uncovered background region are the 2nd thru/or the 4th pixel from the left. Since movement quantity v is 4, in frame #n+1 after one, the 2nd thru/or the 4th pixel belong to a background region only including an ingredient of a background from the left. In frame #n+2 after one, the 2nd thru/or the 4th pixel belong to a background region only including an ingredient of a background from the left.

[0255]Since an object corresponding to a background is standing it still here, a pixel value of the left of frame #n+2 to the 2nd pixel does not change from a pixel value of the left of frame #n+1 to the 2nd pixel. Similarly, a pixel value of the left of frame #n+2 to the 3rd pixel does not change from a pixel value of the left of frame #n+1 to the 3rd pixel, and a pixel value of the left of frame #n+2 to the 4th pixel does not change from a pixel value of the left of frame #n+1 to the 4th pixel.

[0256]That is, since a pixel of frame #n+1 corresponding to a pixel belonging to an uncovered background region in frame #n and frame #n+2 comprises only an ingredient of a background and a pixel value does not change, an absolute value of the difference turns into about 0 value. Therefore, static/dynamic detection to a pixel of frame #n+1 corresponding to a pixel belonging to a mixing zone in frame #n and frame #n+2 is judged by the static/dynamic detection portion 202−1 to be stillness.

[0257]Since a pixel belonging to an uncovered background region in frame #n contains an ingredient of a foreground, a pixel value differs from a case where only an ingredient of a background in frame #n+1 is comprised. Therefore, static/dynamic detection to a pixel belonging to a mixing zone in frame #n and a pixel of corresponding frame #n+1 is judged by the static/dynamic detection portion 202−2 to be a motion.

[0258]Thus, the area judgment part 203−1 judges with a corresponding pixel belonging to an uncovered background region, when a result of static/dynamic detection which shows static/dynamic detection portion 202−2 lost motion is supplied and a result of static/dynamic detection which shows stillness from the static/dynamic detection portion 202−1 is supplied.

[0259]Drawing 50 is a figure showing criteria of the field specific part 103 in frame #n.

A pixel of frame #n−2 in the same position as a position on a picture of a pixel which is the target of a judgment of frame #n, A pixel of frame #n−1 in the same position as a position on a picture of a pixel which a pixel of frame #n−1 in the same position as a position on a picture of a pixel which is the target of a judgment of frame #n is judged to be stillness, and is the target of a judgment of frame #n, When a pixel of frame #n is judged to be a motion, the field specific part 103 judges with a pixel which is the target of a judgment of frame #n belonging to a covered background region.

[0260]A pixel of frame #n−1 in the same position as a position on a picture of a pixel which is the target of a judgment of frame #n, When a pixel of frame #n is judged to be stillness and a pixel of frame #n+1 in the same position as a position on a picture of a pixel of frame #n and a pixel which is the targets of a judgment of frame #n is judged to be stillness, The field specific part 103 judges with a pixel which is the target of a judgment of frame #n belonging to a static region.

[0261]A pixel of frame #n−1 in the same position as a position on a picture of a pixel which is the target of a judgment of frame #n, When a pixel of frame #n is judged to be a motion and a pixel of frame #n+1 in the same position as a position on a picture of a pixel of frame #n and a pixel which is the targets of a judgment of frame #n is judged to be a motion, It judges with a pixel which is the target of a judgment of frame #n moving, and the field specific part 103 belonging to a field.

[0262]A pixel of frame #n+1 in the same position as a position on a picture of a pixel of frame #n and a pixel which is the targets of a judgment of frame #n is judged to be a motion, A pixel of frame #n+1 in the same position as a position on a picture of a pixel which is the target of a judgment of frame #n, When a pixel of frame #n+2 in the same position as a position on a picture of a pixel which is the target of a judgment of frame #n is judged to be stillness, the field specific part 103 judges with a pixel which is the target of a judgment of frame #n belonging to an uncovered background region.

[0263]Drawing 51 is a figure showing an example of a specific result of a field of the field specific part 103. In drawing 51 (A), a pixel judged that belongs to a covered background region is displayed in white. In drawing 51 (B), a pixel judged that belongs to an uncovered background region is displayed in white.

[0264]In drawing 51 (C), a pixel judged that belongs to a motion field is displayed in white. In drawing 51 (D), a pixel judged that belongs to a static region is displayed in white.

[0265]Drawing 52 is a figure showing as a picture area information which shows a mixing zone among area information which the decision flag storing frame memory 206 outputs. In drawing 52, a pixel judged that belongs to a covered background region or an uncovered background region, i.e., a pixel judged that belong to a mixing zone, is displayed in white. Area information which shows a mixing zone which the decision flag storing frame memory 206 outputs shows a portion with a texture surrounded by portion without a texture in a mixing zone and a foreground region.

[0266]Next, with reference to a flow chart of drawing 53, processing of field specification of the field specific part 103 is explained. In Step S201, the frame memory 201 acquires a picture of frame #n-2 containing frame #n which is the target of a judgment thru/or frame #n+2.

[0267]In Step S202, the static/dynamic detection portion 202-3, When it judges whether it is stillness and is judged with stillness by pixel of frame #n-1, and a pixel of the same position of frame #n, it progresses to Step S203, and the static/dynamic detection portion 202-2 is with a pixel of frame #n, and a pixel of the same position of frame #n+1, and judges whether it is stillness.

[0268]By pixel of frame #n, and a pixel of the same position of frame #n+1, when judged with stillness, progress to Step S204 in Step S203, and the area judgment part 203-2, "1" which shows that it belongs to a static region is set as a static region decision flag corresponding to a pixel a field is judged to be. The area judgment part 203-2 supplies a static region decision flag to the decision flag storing frame memory 204, and procedure follows it to Step S205.

[0269]When it is judged with a motion by pixel of frame #n-1, and a pixel of the same position of frame #n in Step S202, Or in Step S203, since a pixel of frame #n does not belong to a static region when judged with a motion by pixel of frame #n, and a pixel of the same position of frame #n+1, processing of Step S204 is skipped and procedure progresses to Step S205.

[0270]In Step S205, the static/dynamic detection portion 202-3, When it judges whether it is a motion and is judged with a motion by pixel of frame #n-1, and a pixel of the same position of frame #n, it progresses to Step S206, and the static/dynamic detection portion 202-2 is with a pixel of frame #n, and a pixel of the same position of frame #n+1, and judges whether it is a motion.

[0271]By pixel of frame #n, and a pixel of the same position of frame #n+1, when judged with a motion, progress to Step S207 in Step S206, and the area judgment part 203-2, "1" which shows that it belongs to a motion field is set as a motion area judgment flag corresponding to a pixel a field is judged to be. The area judgment part 203-2 supplies a motion area judgment flag to the decision flag storing frame memory 204, and procedure follows it to Step S208.

[0272]When it is judged with stillness by pixel of frame #n-1, and a pixel of the same position of frame #n in Step S205, Or in Step S206, since a pixel of frame #n moves by pixel of frame #n, and a pixel of the same position of frame #n+1 and it does not belong to a field by them when judged with stillness, processing of Step S207 is skipped and procedure progresses to Step S208.

[0273]In Step S208, the static/dynamic detection portion 202-4, When it judges whether it is stillness and is judged with stillness by pixel of frame #n-2, and a pixel of the same position of frame #n-1, it progresses to Step S209, and the static/dynamic detection portion 202-3 is with a pixel of frame #n-1, and a pixel of the same position

of frame #n, and judges whether it is a motion.

[0274]By pixel of frame #n−1, and a pixel of the same position of frame #n, when judged with a motion, progress to Step S210 in Step S209, and the area judgment part 203−3, "1" which shows that it belongs to a covered background region is set as a covered background region decision flag corresponding to a pixel a field is judged to be. The area judgment part 203−3 supplies a covered background region decision flag to the decision flag storing frame memory 204, and procedure follows it to Step S211.

[0275]When it is judged with a motion by pixel of frame #n−2, and a pixel of the same position of frame #n−1 in Step S208, Or in Step S209 by pixel of frame #n−1, and a pixel of the same position of frame #n. Since a pixel of frame #n does not belong to a covered background region when judged with stillness, processing of Step S210 is skipped and procedure progresses to Step S211.

[0276]In Step S211, the static/dynamic detection portion 202−2, When it judges whether it is a motion and is judged with a motion by pixel of frame #n, and a pixel of the same position of frame #n+1, it progresses to Step S212, and the static/dynamic detection portion 202−1 is with a pixel of frame #n+1, and a pixel of the same position of frame #n+2, and judges whether it is stillness.

[0277]By pixel of frame #n+1, and a pixel of the same position of frame #n+2, when judged with stillness, progress to Step S213 in Step S212, and the area judgment part 203−1, "1" which shows that it belongs to an uncovered background region is set as an uncovered background region decision flag corresponding to a pixel a field is judged to be. The area judgment part 203−1 supplies an uncovered background region decision flag to the decision flag storing frame memory 204, and procedure follows it to Step S214.

[0278]When it is judged with stillness by pixel of frame #n, and a pixel of the same position of frame #n+1 in Step S211, Or in Step S212 by pixel of frame #n+1, and a pixel of the same position of frame #n+2. Since a pixel of frame #n does not belong to an uncovered background region when judged with a motion, processing of Step S213 is skipped and procedure progresses to Step S214.

[0279]In Step S214, the field specific part 103, When it judges whether a field was pinpointed about all the pixels of frame #n and is judged with pinpointing a field about no pixels of frame #n, procedure returns to Step S202 and repeats processing of field specification about other pixels.

[0280]When judged with having pinpointed a field about all the pixels of frame #n in Step S214, progress to Step S215 and the synchronizer 205, An uncovered background region decision flag memorized by the decision flag storing frame memory 204, And area information which shows a mixing zone is generated based on a covered background region decision flag, Each pixel generates area information which shows that it belongs to either an uncovered background region, a static region, a motion field and a covered background region, generated area information is set as the

decision flag storing frame memory 206, and processing is ended.

[0281]Thus, the field specific part 103 can generate area information which shows that it belongs to a motion field, a static region, an uncovered background region, or a covered background region about each of a pixel contained in a frame.

[0282]When the field specific part 103 applies logical sum to area information corresponding to an uncovered background region and a covered background region, Area information corresponding to a mixing zone is generated, and it may be made to generate area information which comprises a flag which shows that it belongs to a motion field, a static region, or a mixing zone about each of a pixel contained in a frame.

[0283]When an object corresponding to a foreground has a texture, the field specific part 103 can be moved more correctly and can pinpoint a field.

[0284]The field specific part 103 can output area information which shows a static region as area information which shows a foreground region for area information which shows a motion field as area information which shows a background region.

[0285]Although it explained that an object corresponding to a background was standing it still, processing which pinpoints a field mentioned above even if a picture corresponding to a background region included a motion is applicable. For example, while a picture corresponding to a background region is moving uniformly, the field specific part 103 shifts the whole picture corresponding to this motion, and is processed like a case where an object corresponding to a background is standing it still. When a picture corresponding to a background region includes a different motion for every part, the field specific part 103 chooses a pixel corresponding to a motion, and performs above-mentioned processing.

[0286]Drawing 54 is a block diagram showing other examples of composition of the field specific part 103. The field specific part 103 shown in drawing 54 does not use a motion vector. The background image generation part 301 generates a background image corresponding to an inputted image, and supplies a generated background image to the binary object image extraction part 302. The background image generation part 301 extracts an image object corresponding to an object of a background included in an inputted image, for example, and generates a background image.

[0287]An example of a model figure which developed a pixel value of a pixel which adjoins in the motion direction of a picture corresponding to an object of a foreground, and is located in a line with one row to a time direction is shown in drawing 55. For example, a model figure [in / when level / to a screen / in the motion direction of a picture corresponding to an object of a foreground / drawing 55] shows a model which developed a pixel value of an adjoining pixel on one line to a time direction.

[0288]In drawing 55, a line in frame #n is the same as a line in frame #n-1 and frame #n+1.

[0289]In frame #n, in frame #n-1, an ingredient of a foreground corresponding to an

object contained in the 6th pixel thru/or the 17th pixel from the left is contained in the 2nd thru/or the 13th pixel from the left, and is contained in the 10th thru/or the 21st pixel from the left in frame #n+1.

[0290]In frame #n−1, pixels belonging to a covered background region are the 11th thru/or the 13th pixel from the left, and pixels belonging to an uncovered background region are the 2nd thru/or the 4th pixel from the left. In frame #n, pixels belonging to a covered background region are the 15th thru/or the 17th pixel from the left, and pixels belonging to an uncovered background region are the 6th thru/or the 8th pixel from the left. In frame #n+1, pixels belonging to a covered background region are the 19th thru/or the 21st pixel from the left, and pixels belonging to an uncovered background region are the 10th thru/or the 12th pixel from the left.

[0291]In frame #n−1, pixels belonging to a background region are the 14th thru/or the 21st pixel from the 1st pixel and the left from the left. In frame #n, pixels belonging to a background region are the 18th thru/or the 21st pixel from the 1st thru/or the 5th pixel, and the left from the left. In frame #n+1, pixels belonging to a background region are the 1st thru/or the 9th pixel from the left.

[0292]An example of a background image corresponding to an example of drawing 55 which the background image generation part 301 generates is shown in drawing 56. A background image comprises a pixel corresponding to an object of a background, and does not contain an ingredient of a picture corresponding to an object of a foreground.

[0293]Based on correlation of a background image and an inputted image, the binary object image extraction part 302 generates a binary object image, and supplies a generated binary object image to the temporal change primary detecting element 303.

[0294]Drawing 57 is a block diagram showing composition of the binary object image extraction part 302. The correlation value operation part 321 calculates correlation of a background image and an inputted image which were supplied from the background image generation part 301, and supplies a correlation value which generated and generated a correlation value to the threshold treating part 322.

[0295]As are shown in drawing 58 (A), and it is indicated in drawing 58 (B) as a block in a background image of 3x3 centering on X_4, the correlation value operation part 321, for example, A correlation value corresponding to Y_4 is computed by applying a formula (4) to a block in an inputted image of 3x3 centering on Y_4 corresponding to a block in a background image.

[0296]

[Equation 2]

$$\text{相関値} = \frac{\sum_{i=0}^{8}(X_i-\bar{X})\sum_{i=0}^{8}(Y_i-\bar{Y})}{\sqrt{\sum_{i=0}^{8}(X_i-\bar{X})^2 \cdot \sum_{i=0}^{8}(Y_i-\bar{Y})^2}} \qquad (4)$$

[Equation 3]

$$\overline{X} = \frac{\sum_{i=0}^{8} X_i}{9} \qquad (5)$$

[Equation 4]

$$\overline{Y} = \frac{\sum_{i=0}^{8} Y_i}{9} \qquad (6)$$

[0297]The correlation value operation part 321 supplies a correlation value computed in this way corresponding to each pixel to the threshold treating part 322.

[0298]As shown in drawing 59 (A), the correlation value operation part 321, for example, It may be made to compute a difference absolute value corresponding to Y_4 by applying a formula (7) to a block in a background image of 3x3 centering on X_4, and a block in an inputted image of 3x3 centering on Y_4 corresponding to [as shown in drawing 59 (B)] a block in a background image.

[0299]

[Equation 5]

$$\text{差分絶対値和} = \sum_{i=0}^{8} |(X_i - Y_i)| \qquad (7)$$

[0300]The correlation value operation part 321 is supplied to the threshold treating part 322 by making into a correlation value a difference absolute value computed in this way.

[0301]The threshold treating part 322 compares a pixel value of a correlation picture with threshold th0, When a correlation value is the zero or less threshold th, 1 is set as a pixel value of a binary object image, when a correlation value is larger than threshold th0, 0 is set as a pixel value of a binary object image, and 0 or 1 outputs a binary object image set as a pixel value. It may be made for the threshold treating part 322 to use threshold th0 which it may be made to memorize threshold th0 beforehand, or was inputted from the outside.

[0302]Drawing 60 is a figure showing an example of a binary object image corresponding to a model of an inputted image shown in drawing 55. In a binary object image, 0 is set to a high pixel of a background image and correlation at a pixel value.

[0303]Drawing 61 is a block diagram showing composition of the temporal change primary detecting element 303. The frame memory 341 memorizes a binary object image of frame #n-1 supplied from binary object image extraction part 302, frame #n, and frame #n+1, when judging a field about a pixel of frame #n.

[0304]Based on a binary object image of frame #n−1 memorized by frame memory 341, frame #n, and frame #n+1, the area judgment part 342 judges a field about each pixel of frame #n, and outputs area information which generated and generated area information.

[0305]Drawing 62 is a figure explaining a judgment of the area judgment part 342. When a pixel which is observing a binary object image of frame #n is 0, the area judgment part 342 judges with a pixel which is observing frame #n belonging to a background region.

[0306]When a pixel which is observing a binary object image of frame #n is 1, a pixel to which a binary object image of frame #n−1 corresponds is 1 and a pixel to which a binary object image of frame #n+1 corresponds is 1, The area judgment part 342 judges with a pixel which frame #n is observing belonging to a foreground region.

[0307]A pixel which is observing a binary object image of frame #n is 1, and when a pixel to which a binary object image of frame #n−1 corresponds is 0, the area judgment part 342 judges with a pixel which is observing frame #n belonging to a covered background region.

[0308]A pixel which is observing a binary object image of frame #n is 1, and when a pixel to which a binary object image of frame #n+1 corresponds is 0, the area judgment part 342 judges with a pixel which is observing frame #n belonging to an uncovered background region.

[0309]Drawing 63 is a figure showing an example which the temporal change primary detecting element 303 judged about a binary object image corresponding to a model of an inputted image shown in drawing 55. Since a pixel to which frame #n of a binary object image corresponds is 0, the temporal change primary detecting element 303 judges that the 1st thru/or the 5th pixel belong to a background region from the left of frame #n.

[0310]A pixel of frame #n of a binary object image is 1, and since a pixel to which frame #n+1 corresponds is 0, the temporal change primary detecting element 303 judges that the 6th thru/or the 9th pixel belong to an uncovered background region from the left.

[0311]A pixel of frame #n of a binary object image is 1, a pixel to which frame #n−1 corresponds is 1, and since a pixel to which frame #n+1 corresponds is 1, the temporal change primary detecting element 303 judges that the 10th thru/or the 13th pixel belong to a foreground region from the left.

[0312]A pixel of frame #n of a binary object image is 1, and since a pixel to which frame #n−1 corresponds is 0, the temporal change primary detecting element 303 judges that the 14th thru/or the 17th pixel belong to a covered background region from the left.

[0313]Since a pixel to which frame #n of a binary object image corresponds is 0, the temporal change primary detecting element 303 judges that the 18th thru/or the 21st

pixel belong to a background region from the left.

[0314]Next, with reference to a flow chart of drawing 64, processing of field specification of the area judgment part 103 is explained. In Step S301, the background image generation part 301 of the area judgment part 103 extracts an image object corresponding to an object of a background included in an inputted image based on an inputted image, for example, and supplies a background image which generated and generated a background image to the binary object image extraction part 302.

[0315]In Step S302, the binary object image extraction part 302 calculates a correlation value of an inputted image and a background image supplied from the background image generation part 301 by the operation explained with reference to drawing 58, for example. In Step S303, the binary object image extraction part 302 calculates a binary object image from correlation value and threshold th0, for example by comparing a correlation value with threshold th0.

[0316]In Step S304, the temporal change primary detecting element 303 performs processing of an area judgment, and ends processing.

[0317]With reference to a flow chart of drawing 65, details of processing of an area judgment corresponding to Step S304 are explained. In Step S321, the area judgment part 342 of the temporal change primary detecting element 303, In [in frame #n memorized by the frame memory 341, judge whether a pixel to observe is 0, and] frame #n, When judged with a pixel to observe being 0, it progresses to Step S322, and if a pixel which frame #n observes belongs to a background region, it will set up, and processing is ended.

[0318]When judged with a pixel to observe being 1 in frame #n in Step S321, progress to Step S323 and the area judgment part 342 of the temporal change primary detecting element 303, In [in frame #n memorized by the frame memory 341, a pixel to observe is 1, and] frame #n−1, In [judge whether a corresponding pixel is 0 and a pixel to observe is 1 in frame #n, and] frame #n−1, When judged with a corresponding pixel being 0, it progresses to Step S324, and if a pixel which frame #n observes belongs to a covered background region, it will set up, and processing is ended.

[0319]In Step S323, in frame #n. [whether a pixel to observe is 0 and] Or when judged with a corresponding pixel being 1 in frame #n−1, progress to Step S325 and the area judgment part 342 of the temporal change primary detecting element 303, In [in frame #n memorized by the frame memory 341, a pixel to observe is 1, and] frame #n+1, In [judge whether a corresponding pixel is 0 and a pixel to observe is 1 in frame #n, and] frame #n+1, When judged with a corresponding pixel being 0, it progresses to Step S326, and if a pixel which frame #n observes belongs to an uncovered background region, it will set up, and processing is ended.

[0320]In Step S325, in frame #n. [whether a pixel to observe is 0 and] Or in frame #n+1, when judged with a corresponding pixel being 1, it progresses to Step S327, and the area judgment part 342 of the temporal change primary detecting element 303

sets a pixel which frame #n observes to a foreground region, and ends processing.

[0321]Thus, based on a correlation value of a picture as which the field specific part 103 was inputted, and a corresponding background image, It can be specified whether a pixel of an inputted image belongs to either a foreground region, a background region, a covered background region and an uncovered background region, and area information corresponding to a specified result can be generated.

[0322]Drawing 66 is a block diagram showing other composition of the field specific part 103. The field specific part 103 shown in drawing 66 uses a motion vector supplied from the motion detection part 102, and its position information. The same number is given to the same portion as a case where it is shown in drawing 54, and the explanation is omitted.

[0323]The robust-ized part 361 generates a binary object image made robust based on a binary object image of N frames supplied from the binary object image extraction part 302, and outputs it to it in the temporal change primary detecting element 303.

[0324]Drawing 67 is a block diagram explaining composition of the robust-ized part 361. The motion compensation section 381 outputs a binary object image which compensated a motion of a binary object image of N frames and with which a motion was compensated to the switch 382 based on a motion vector supplied from the motion detection part 102, and its position information.

[0325]With reference to an example of drawing 68 and drawing 69, a motion compensation of the motion compensation section 381 is explained. For example, frame #n-1, frame #n which show drawing 68 an example when judging a field of frame #n, And when a binary object image of frame #n+1 is inputted, the motion compensation section 381, Based on a motion vector supplied from the motion detection part 102, as an example is shown in drawing 69, the motion compensation of a binary object image of frame #n-1 and the binary object image of frame #n+1 is carried out, and a binary object image by which the motion compensation was carried out is supplied to the switch 382.

[0326]The switch 382 outputs a binary object image in which the motion compensation of the 1st frame was carried out to the frame memory 383-1, and outputs a binary object image in which the motion compensation of the 2nd frame was carried out to the frame memory 383-2. Similarly the switch 382 outputs each of a binary object image in which the motion compensation of the 3rd thru/or the N-1st frames was carried out to either the frame memory 383-3 thru/or frame memory 383-(N-1), A binary object image in which the motion compensation of the Nth frame was carried out is outputted to frame memory 383-N.

[0327]The frame memory 383-1 memorizes a binary object image in which the motion compensation of the 1st frame was carried out, and outputs a binary object image memorized to the weighting section 384-1. The frame memory 383-2 memorizes a binary object image in which the motion compensation of the 2nd frame was carried

out, and outputs a binary object image memorized to the weighting section 384-2.

[0328]Similarly each of the frame memory 383-3 thru/or frame memory 383- (N-1), Either of the binary object images in which the motion compensation of the 3rd frame thru/or the N-1st frames was carried out is memorized, and a binary object image memorized is outputted to either the weighting section 384-3 thru/or weighting section 384- (N-1). Frame memory 383-N memorizes a binary object image in which the motion compensation of the Nth frame was carried out, and outputs a binary object image memorized to weighting section 384-N.

[0329]The weighting section 384-1 multiplies by the dignity w1 beforehand provided in a pixel value of a binary object image in which the motion compensation of the 1st frame supplied from the frame memory 383-1 was carried out, and supplies it to the integrating part 385. The weighting section 384-2 multiplies by the dignity w2 beforehand provided in a pixel value of a binary object image in which the motion compensation of the 2nd frame supplied from the frame memory 383-2 was carried out, and supplies it to the integrating part 385.

[0330]Similarly each of the weighting section 384-3 thru/or weighting section 384-(N-1), It multiplies by either of the dignity w3 thru/or dignity w (N-1) beforehand provided in a pixel value of a binary object image in which the motion compensation of the 3rd supplied from either the frame memory 383-3 thru/or frame memory 383-(N-1) thru/or the N-1st ones of the frames was carried out, The integrating part 385 is supplied. Weighting section 384-N multiplies by the dignity wN beforehand provided in a pixel value of a binary object image in which the motion compensation of the Nth frame supplied from frame memory 383-N was carried out, and supplies it to the integrating part 385.

[0331]The integrating part 385 generates a binary object image by comparing with threshold th0 by which the motion compensation of the 1 thru/or Nth frame was carried out, and either of the dignity w1 thru/or wN was able to multiply, respectively and which integrated a pixel value to which a binary object image corresponds, and defined an integrated pixel value beforehand.

[0332]Thus, since the robust-ized part 361 generates a binary OBUJIETO picture made robust from N binary object images and supplies it to the temporal change primary detecting element 303, The field specific part 103 which shows drawing 66 composition can pinpoint a field more correctly as compared with a case where it is shown in drawing 54, even if a noise is contained in an inputted image.

[0333]Next, processing of field specification of the field specific part 103 which shows composition in drawing 66 is explained with reference to a flow chart of drawing 70. Since processing of Step S341 thru/or Step S343 is the same as that of Step S301 thru/or Step S303 explained with a flow chart of drawing 64 respectively, the explanation is omitted.

[0334]In Step S344, the robust-ized part 361 performs processing of robust-izing.

[0335]In Step S345, the temporal change primary detecting element 303 performs processing of an area judgment, and ends processing. Since details of processing of Step S345 are the same as that of processing explained with reference to a flow chart of drawing 65, the explanation is omitted.

[0336]Next, with reference to a flow chart of drawing 71, details of processing of robust-izing corresponding to processing of Step S344 of drawing 70 are explained. In Step S361, the motion compensation section 381 performs processing of a motion compensation of a binary object image inputted based on a motion vector supplied from the motion detection part 102, and its position information. In Step S362, either the frame memory 383-1 thru/or 383-N memorize a binary object image which was supplied via the switch 382 and by which the motion compensation was carried out.

[0337]In Step S363, the robust-ized part 361, When it judges whether N binary object images were memorized and is judged with N binary object images not being memorized, it returns to Step S361 and processing of a motion compensation of a binary object image and processing of memory of a binary object image are repeated.

[0338]In Step S363, when judged with N binary object images having been memorized, it progresses to Step S364, and each of the weighting section 384-1 thru/or 384-N multiplies by it and carries out weighting of the dignity of either w1 thru/or wN to each of N binary object images.

[0339]In Step S365, the integrating part 385 integrates N binary object images by which weighting was carried out.

[0340]In Step S366, by comparison with threshold th1 defined beforehand, etc., the integrating part 385 generates a binary object image from an integrated picture, and ends processing, for example.

[0341]Thus, the field specific part 103 which shows drawing 66 composition can generate area information based on a binary object image made robust.

[0342]As mentioned above, the field specific part 103 can generate area information which shows that it belongs to a motion field, a static region, an uncovered background region, or a covered background region about each of a pixel contained in a frame.

[0343]Drawing 72 is a block diagram showing an example of composition of the mixture ratio calculation part 104. Based on an inputted image, by the operation corresponding to a model of a covered background region, the presumed mixture ratio treating part 401 computes the presumed mixture ratio for every pixel, and supplies the computed presumed mixture ratio to the mixture ratio deciding part 403.

[0344]Based on an inputted image, by the operation corresponding to a model of an uncovered background region, the presumed mixture ratio treating part 402 computes the presumed mixture ratio for every pixel, and supplies the computed presumed mixture ratio to the mixture ratio deciding part 403.

[0345]Since it can assume that an object corresponding to a foreground is moving at

uniform velocity in shutter time, as for the mixture ratio alpha of a pixel belonging to a mixing zone, it has the following character. That is, the mixture ratio alpha changes linearly corresponding to change of a position of a pixel. If change of a position of a pixel is made into one dimension, change of the mixture ratio alpha can be expressed in a straight line, and if change of a position which is a pixel is made into two dimensions, change of the mixture ratio alpha can be expressed at a flat surface.

[0346]Since a period of one frame is short, an object corresponding to a foreground is a rigid body, and assumption will be realized if it is moving at uniform velocity.

[0347]In this case, inclination of the mixture ratio alpha serves as a reciprocal ratio of movement quantity v within shutter time of a foreground.

[0348]An example which is the ideal mixture ratio alpha is shown in drawing 73. The inclination l in a mixing zone which is the ideal mixture ratio alpha can be expressed as a reciprocal of movement quantity v.

[0349]it is shown in drawing 73 -- as -- the ideal mixture ratio -- in a background region, alpha has a value of 1, in a foreground region, it has a value of 0, exceeds 0 in a mixing zone, and has less than one value.

[0350]In an example of drawing 74, the pixel value C06 of the 7th pixel can be expressed with a formula (8) using the pixel value P06 of the left of frame #n-1 to the 7th pixel from the left of frame #n.

[0351]

[Equation 6]

$$\begin{aligned} C06 &= B06/v + B06/v + F01/v + F02/v \\ &= P06/v + P06/v + F01/v + F02/v \\ &= 2/v \cdot P06 + \sum_{i=1}^{2} Fi/v \end{aligned} \qquad (8)$$

[0352]In a formula (8), the pixel value M and the pixel value P06 of a pixel of a mixing zone are expressed for the pixel value C06 as the pixel value B of the pixel of a background region. That is, the pixel value M of the pixel of a mixing zone and the pixel value B of the pixel of a background region can be expressed like a formula (9) and a formula (10), respectively.

[0353]

M=C06 (9)

B=P06 (10)

[0354]2/v in a formula (8) correspond to the mixture ratio alpha. Since movement quantity v is 4, the mixture ratio alpha of the 7th pixel is set to 0.5 from the left of frame #n.

[0355]As mentioned above, the formula (3) showing the mixture ratio alpha by considering that the pixel value C of frame #n currently observed is a pixel value of a

mixing zone, and considering that the pixel value P of frame #n−1 in front of frame #n is a pixel value of a background region is rewritten like a formula (11).

[0356]

C=alpha−P+f (11)

f of a formula (11) is peace sigma$_i$Fi/v of an ingredient of a foreground included in a pixel currently observed. A variable included in a formula (11) is two, the mixture ratio alpha and the sum f of an ingredient of a foreground.

[0357]Similarly, movement quantity v in an uncovered background region is 4, and the virtual number of partitions of a time direction shows drawing 75 a model which is 4 and which developed a pixel value to a time direction.

[0358]In an uncovered background region, like expression in a covered background region mentioned above, A formula (3) showing the mixture ratio alpha by considering that the pixel value C of frame #n currently observed is a pixel value of a mixing zone, and considering that the pixel value N of frame #n+1 after frame #n is a pixel value of a background region can be expressed like a formula (12).

[0359]

C=alpha−N+f (12)

[0360]Although it explained that an object of a background was standing it still, when an object of a background is moving, a formula (8) thru/or a formula (12) can be applied by using a pixel value of a pixel of a position made to correspond to movement quantity v of a background. For example, in drawing 74, movement quantity v of an object corresponding to a background is 2, and when the virtual number of partitions is 2, while an object corresponding to a background is moving to right−hand side in a figure, let the pixel value B of a pixel of a background region in a formula (10) be the pixel value P04.

[0361]Since a formula (11) and a formula (12) include two variables, respectively, they cannot ask for the mixture ratio alpha as it is. Here, a picture serves as the almost same pixel value by the pixels which approach since correlation is generally spatially strong.

[0362]Then, since a foreground ingredient has spatially strong correlation, it transforms a formula so that the sum f of an ingredient of a foreground can be drawn from a frame of before or the back, and asks for the mixture ratio alpha.

[0363]The pixel value Mc of the 7th pixel can be expressed with a formula (13) from the left of frame #n of drawing 76.

[0364]

[Equation 7]

$$Mc = \frac{2}{v} \cdot B06 + \sum_{i=11}^{12} Fi/v \qquad (13)$$

2/v of the 1st paragraph of the right−hand side of a formula (13) are equivalent to the

mixture ratio alpha. Suppose that the 2nd paragraph of the right-hand side of a formula (13) is expressed like a formula (14) using the pixel value of next frame #n+1.

[0365]

[Equation 8]

$$\sum_{i=11}^{12} Fi/v = \beta \cdot \sum_{i=7}^{10} Fi/v \qquad (14)$$

[0366]Here, suppose that a formula (15) is materialized using the spatial correlations of the ingredient of a foreground.

[0367]

F=F05=F06=F07=F08=F09=F10=F11=F12 (15)

A formula (14) can be replaced like a formula (16) using a formula (15).

[0368]

[Equation 9]

$$\sum_{i=11}^{12} Fi/v = \frac{2}{v} \cdot F$$

$$= \beta \cdot \frac{4}{v} \cdot F \qquad (16)$$

beta can be expressed with a formula (17) as a result.

[0369]

beta = two fourths (17)

[0370]If it generally assumes that an ingredient of a foreground related to a mixing zone is equal as shown in a formula (15), a formula (18) will be materialized from a relation of an internal ratio about all the pixels of a mixing zone.

[0371]

beta=1-alpha (18)

[0372]A formula (18) is materialized, then a formula (11) can be developed as shown in a formula (19).

[0373]

[Equation 10]

$$C = \alpha \cdot P + f$$

$$= \alpha \cdot P + (1-\alpha) \cdot \sum_{i=\gamma}^{\gamma+V-1} Fi/v$$

$$= \alpha \cdot P + (1-\alpha) \cdot N \qquad (19)$$

[0374]Similarly, a formula (18) is materialized, then a formula (12) can be developed as shown in a formula (20).

[0375]

[Equation 11]

$$C = \alpha \cdot N + f$$

$$= \alpha \cdot N + (1-\alpha) \cdot \sum_{i=\gamma}^{\gamma+V-1} Fi/v$$

$$= \alpha \cdot N + (1-\alpha) \cdot P \qquad (20)$$

[0376]In a formula (19) and a formula (20), since C, N, and P are known pixel values, a variable included in a formula (19) and a formula (20) is the mixture ratio alpha. A relation of C in a formula (19) and a formula (20), N, and P is shown in drawing 77. C is a pixel value of a pixel which frame #n is observing which computes the mixture ratio alpha. N is a pixel value which are a pixel currently observed and a pixel of frame #n+1 to which a position of the direction of space corresponds. P is a pixel value which are a pixel currently observed and a pixel of frame #n-1 to which a position of the direction of space corresponds.

[0377]Therefore, since one variable will be included in each of a formula (19) and a formula (20), the mixture ratio alpha is computable using a pixel value of a pixel of three frames. Conditions for the right mixture ratio alpha to be computed by solving a formula (19) and a formula (20), In an image object of a foreground picturized while an ingredient of a foreground related to a mixing zone was equal, namely, an object of a foreground was standing it still, It is a pixel corresponding to the direction of a motion of an object of a foreground located in a boundary of an image object, and a pixel value of a pixel which one twice the number of movement quantity v is following is a fixed thing.

[0378]As mentioned above, the mixture ratio alpha of a pixel belonging to a covered background region is computed by formula (21), and the mixture ratio alpha of a pixel belonging to an uncovered background region is computed by formula (22).

[0379]

alpha=(C-N)/(P-N) (21)

alpha=(C-P)/(N-P) (22)

[0380]Drawing 78 is a block diagram showing composition of the presumed mixture ratio treating part 401. The frame memory 421 memorizes an inputted picture per frame, and supplies a frame after [of a frame inputted as an inputted image] one to the frame memory 422 and the mixture ratio operation part 423.

[0381]The frame memory 422 memorizes an inputted picture per frame, and supplies a frame after [of a frame currently supplied from the frame memory 421] one to the mixture ratio operation part 423.

[0382]Therefore, when frame #n+1 is inputted into the mixture ratio operation part 423 as an inputted image, the frame memory 421 supplies frame #n to the mixture ratio operation part 423, and the frame memory 422 supplies frame #n-1 to the

mixture ratio operation part 423.

[0383]The pixel value C of a pixel which frame #n is observing by the operation which shows the mixture ratio operation part 423 in a formula (21). The presumed mixture ratio of a pixel which is observing based on the pixel value P of a pixel currently observed, the pixel value N of a pixel of frame #n+1 to which a space position corresponds and a pixel currently observed, and a pixel of frame #n−1 to which a space position corresponds is computed, and the computed presumed mixture ratio is outputted. For example, while a background is standing it still, the mixture ratio operation part 423, the pixel value C of a pixel which frame #n is observing, and a position in a pixel currently observed and a frame -- the same. the pixel value N of a pixel of frame #n+1, and a position in a pixel currently observed and a frame -- the same --- the presumed mixture ratio of a pixel currently observed is computed based on the pixel value P which is a pixel of frame #n−1, and the computed presumed mixture ratio is outputted to it.

[0384]Thus, based on an inputted image, the presumed mixture ratio treating part 401 can compute the presumed mixture ratio, and can supply it to the mixture ratio deciding part 403.

[0385]By the operation the presumed mixture ratio treating part 401 indicates the presumed mixture ratio treating part 402 to be to a formula (21). Except for portions which compute the presumed mixture ratio of a pixel currently observed by the operation shown in a formula (22) differing to computing the presumed mixture ratio of a pixel currently observed, since it is the same as that of the presumed mixture ratio treating part 401, the explanation is omitted.

[0386]Drawing 79 is a figure showing an example of the presumed mixture ratio computed by the presumed mixture ratio treating part 401. The presumed mixture ratio shown in drawing 79 shows a result in case movement quantity v of a foreground corresponding to an object which is moving at uniform velocity is 11 to one line.

[0387]As the presumed mixture ratio is shown in drawing 73 in a mixing zone, it turns out that it is changing almost linearly.

[0388]. Returned to drawing 72 and the mixture ratio deciding part 403 was supplied from the field specific part 103. A pixel which is the target of calculation which is the mixture ratio alpha sets up the mixture ratio alpha based on area information which shows whether it belongs to either a foreground region, a background region, a covered background region or an uncovered background region. The mixture ratio deciding part 403 sets 0 as the mixture ratio alpha, when the target pixel belongs to a foreground region, When the target pixel belongs to a background region, 1 is set as the mixture ratio alpha and the target pixel belongs to a covered background region, When the presumed mixture ratio supplied from the presumed mixture ratio treating part 401 is set as the mixture ratio alpha and the target pixel belongs to an uncovered background region, the presumed mixture ratio supplied from the presumed mixture

ratio treating part 402 is set as the mixture ratio alpha. the mixture ratio which the mixture ratio deciding part 403 set up based on area information -- alpha is outputted.

[0389]Drawing 80 is a block diagram showing other composition of the mixture ratio calculation part 104. The selecting part 441 supplies a pixel of a next frame to the presumed mixture ratio treating part 442, before corresponding to a pixel belonging to a covered background region, and this based on area information supplied from the field specific part 103. The selecting part 441 supplies a pixel of a next frame to the presumed mixture ratio treating part 443, before corresponding to a pixel belonging to an uncovered background region, and this based on area information supplied from the field specific part 103.

[0390]Based on a pixel value inputted from the selecting part 441, the presumed mixture ratio treating part 442 computes the presumed mixture ratio of a pixel currently observed belonging to a covered background region by the operation shown in a formula (21), and supplies the computed presumed mixture ratio to the selecting part 444.

[0391]Based on a pixel value inputted from the selecting part 441, the presumed mixture ratio treating part 443 computes the presumed mixture ratio of a pixel currently observed belonging to an uncovered background region by the operation shown in a formula (22), and supplies the computed presumed mixture ratio to the selecting part 444.

[0392]When the presumed mixture ratio which is 0 when the target pixel belongs to a foreground region based on area information supplied from the field specific part 103 is chosen, it is set as the mixture ratio alpha and the target pixel belongs to a background region, the selecting part 444 chooses the presumed mixture ratio which is 1, and sets it as the mixture ratio alpha. When the target pixel [selecting part / 444] belongs to a covered background region, choosing the presumed mixture ratio supplied from the presumed mixture ratio treating part 442 -- the mixture ratio -- choosing the presumed mixture ratio supplied from the presumed mixture ratio treating part 443, when it is set as alpha and the target pixel belongs to an uncovered background region -- the mixture ratio -- it is set as alpha. the mixture ratio which chose the selecting part 444 based on area information, and was set up -- alpha is outputted.

[0393]thus, the mixture ratio computed by the mixture ratio calculation part 104 which has other composition shown in drawing 80 having computed the mixture ratio alpha for every pixel in which a picture is included -- alpha can be outputted.

[0394]With reference to a flow chart of drawing 81, processing of calculation of the mixture ratio alpha of the mixture ratio calculation part 104 which shows composition in drawing 72 is explained. In Step S401, the mixture ratio calculation part 104 acquires area information supplied from the field specific part 103. In Step S402, the presumed mixture ratio treating part 401 performs processing of an operation of the

presumed mixture ratio with a model corresponding to a covered background region, and supplies the computed presumed mixture ratio to the mixture ratio deciding part 403. Details of processing of an operation of mixture ratio presumption are later mentioned with reference to a flow chart of drawing 82.

[0395]In Step S403, the presumed mixture ratio treating part 402 performs processing of an operation of the presumed mixture ratio with a model corresponding to an uncovered background region, and supplies the computed presumed mixture ratio to the mixture ratio deciding part 403.

[0396]In Step S404, the mixture ratio calculation part 104 judges whether the mixture ratio alpha was presumed about the whole frame, when judged with not presuming the mixture ratio alpha about the whole frame, returns to Step S402 and performs processing which presumes the mixture ratio alpha about the following pixel.

[0397]About the whole frame, when judged with having presumed the mixture ratio alpha, progress to Step S405 in Step S404, and the mixture ratio deciding part 403, A pixel sets up the mixture ratio alpha based on area information supplied from the field specific part 103 which shows whether it belongs to either a foreground region, a background region, a covered background region or an uncovered background region. The mixture ratio deciding part 403 sets 0 as the mixture ratio alpha, when the target pixel belongs to a foreground region, When the target pixel belongs to a background region, 1 is set as the mixture ratio alpha and the target pixel belongs to a covered background region, When the presumed mixture ratio supplied from the presumed mixture ratio treating part 401 is set as the mixture ratio alpha and the target pixel belongs to an uncovered background region, the presumed mixture ratio supplied from the presumed mixture ratio treating part 402 is set as the mixture ratio alpha, and processing is ended.

[0398]thus, the mixture ratio which is the characteristic quantity corresponding to each pixel area information to which the mixture ratio calculation part 104 was supplied from the field specific part 103, and based on an inputted image -- alpha is computable.

[0399]Since processing of calculation of the mixture ratio alpha of the mixture ratio calculation part 104 which shows composition in drawing 80 is the same as processing explained with a flow chart of drawing 81, the explanation is omitted.

[0400]Next, processing of mixture ratio presumption by a model corresponding to a covered background region corresponding to Step S402 of drawing 81 is explained with reference to a flow chart of drawing 82.

[0401]In Step S421, the mixture ratio operation part 423 acquires the pixel value C of a noticed picture element of frame #n from the frame memory 421.

[0402]In Step S422, the mixture ratio operation part 423 acquires the pixel value P of a pixel of frame #n-1 corresponding to a noticed picture element from the frame memory 422.

[0403]In Step S423, the mixture ratio operation part 423 acquires the pixel value N of a pixel of frame #n+1 corresponding to a noticed picture element contained in an inputted image.

[0404]In Step S424, the mixture ratio operation part 423 calculates the presumed mixture ratio based on the pixel value C of a noticed picture element of frame #n, the pixel value P of a pixel of frame #n−1, and the pixel value N of a pixel of frame #n+1.

[0405]In Step S425, the mixture ratio operation part 423, When it judges whether processing which calculates the presumed mixture ratio was ended about the whole frame and judged with not having ended processing which calculates the presumed mixture ratio about the whole frame, it returns to Step S421 and processing which computes the presumed mixture ratio about the following pixel is repeated.

[0406]In Step S425, when judged with having ended processing which calculates the presumed mixture ratio about the whole frame, processing is ended.

[0407]Thus, the presumed mixture ratio treating part 401 can calculate the presumed mixture ratio based on an inputted image.

[0408]Since processing of mixture ratio presumption by a model corresponding to an uncovered background region in Step S403 of drawing 81 is the same as processing shown in a flow chart using a formula corresponding to a model of an uncovered background region of drawing 82, the explanation is omitted.

[0409]Since the same processing as a flow chart shown in drawing 82 is performed and the presumed mixture ratio is calculated, the presumed mixture ratio treating part 442 and the presumed mixture ratio treating part 443 which are shown in drawing 80 omit the explanation.

[0410]the mixture ratio mentioned above even if a picture corresponding to a background region included a motion although it explained that an object corresponding to a background was standing it still -- processing which asks for alpha is applicable. For example, while a picture corresponding to a background region is moving uniformly, the presumed mixture ratio treating part 401 shifts the whole picture corresponding to a motion of a background, and is processed like a case where an object corresponding to a background is standing it still. When a picture corresponding to a background region includes a motion of a different background for every part, the presumed mixture ratio treating part 401 chooses a pixel corresponding to a motion of a background as a pixel corresponding to a pixel belonging to a mixing zone, and performs above-mentioned processing.

[0411]The mixture ratio calculation part 104 performs only processing of mixture ratio presumption by a model corresponding to a covered background region about all the pixels, and it may be made to output the computed presumed mixture ratio as the mixture ratio alpha. In this case, the mixture ratio alpha shows a rate of an ingredient of a background about a pixel belonging to a covered background region, and shows a rate of an ingredient of a foreground about a pixel belonging to an uncovered

background region. the mixture ratio computed in this way about a pixel belonging to an uncovered background region, if an absolute value of difference of alpha and 1 is computed and a computed absolute value is set as the mixture ratio alpha, the mixture ratio the separation server 11 indicates a rate of an ingredient of a background to be about a pixel belonging to an uncovered background region -- it can ask for alpha.

[0412]The mixture ratio calculation part 104 performs only processing of mixture ratio presumption by a model corresponding to an uncovered background region about all the pixels, and it may be made to output the computed presumed mixture ratio as the mixture ratio alpha similarly.

[0413]next -- using character in which the mixture ratio alpha changes linearly -- the mixture ratio -- the mixture ratio calculation part 104 which computes alpha is explained.

[0414]As mentioned above, since a formula (11) and a formula (12) include two variables, respectively, they cannot ask for the mixture ratio alpha as it is.

[0415]Then, [in shutter time] corresponding to change of a position of a pixel by an object corresponding to a foreground moving at uniform velocity, a formula which approximated the sum f of an ingredient of the mixture ratio alpha and a foreground in the direction of space is stood using character in which the mixture ratio alpha changes linearly. A formula which approximated the sum f of an ingredient of the mixture ratio alpha and a foreground is solved using plurality of a group of a pixel value of a pixel belonging to a pixel value and a background region of a pixel belonging to a mixing zone.

[0416]When change which is the mixture ratio alpha is approximated as a straight line, the mixture ratio alpha is expressed with a formula (23).

[0417]

Alpha=il+p (23)

In a formula (23), i is an index of the direction of space which set a position of a pixel currently observed to 0. l is a slope of a line of the mixture ratio alpha. p is the mixture ratio alpha of a pixel which is a section of a straight line of the mixture ratio alpha and which is both observed. In a formula (23), although the index i is known, the inclination l and its section p are strange.

[0418]Relation between the index i, the inclination l, and the section p is shown in drawing 83.

[0419]the mixture ratio -- the mixture ratio from which plurality differs to two or more pixels by approximating alpha like a formula (23) -- alpha is expressed by two variables. In an example shown in drawing 83, the five mixture ratio to five pixels is expressed by the inclination l which is two variables, and the section p.

[0420]That a picture is horizontal and when the mixture ratio alpha is approximated at a flat surface shown in drawing 84, and the motion v corresponding to the two directions of vertical is taken into consideration, a formula (23) is extended to a flat

surface and the mixture ratio alpha is expressed with a formula (24).

[0421]

Alpha=jm+kq+p (24)

In a formula (24), j is the horizontal index which set a position of a pixel currently observed to 0, and k is a vertical index. m is horizontal inclination to a field of the mixture ratio alpha, and q is inclination to a perpendicular direction of a field of the mixture ratio alpha. p is a section of a field of the mixture ratio alpha.

[0422]For example, in frame #n shown in drawing 74, a formula (25) thru/or a formula (27) are materialized about C05 thru/or C07, respectively.

[0423]

C05=alpha05$_{and}$B05/v+f05 (25)

C06=alpha06$_{and}$B06/v+f06 (26)

C07=alpha07$_{and}$B07/v+f07 (27)

[0424]An ingredient of a foreground is nearby in agreement, namely, if F01 thru/or F03 are transposed to Fc, a formula (28) will be materialized noting that F01 thru/or F03 are equal.

[0425]

f(x) = (1-alpha(x)) and Fc (28)

In a formula (28), x expresses a position of the direction of space.

[0426]If alpha(x) is replaced by a formula (24), a formula (28) can be expressed as a formula (29).

[0427]

= [f(x)] (1- (jm+kq+p)), Fc=j, +k, and (-q-Fc) +(1-p) (-Fc) =js+kt+u (29)

[0428]In a formula (29), (-m-Fc), (-q-Fc), and (1-p) -Fc are replaced, as shown in a formula (30) thru/or a formula (32).

[0429]

s=-m-Fc (30)

t=-q-Fc (31)

u = (1-p) and Fc (32)

[0430]In a formula (29), j is the horizontal index which set a position of a pixel currently observed to 0, and k is a vertical index.

[0431]Thus, into shutter time, an object corresponding to a foreground moves at uniform velocity, and since assumption that an ingredient corresponding to a foreground is constant in the neighborhood is materialized, the sum of an ingredient of a foreground is approximated by a formula (29).

[0432]When it approximates the mixture ratio alpha in a straight line, the sum of an ingredient of a foreground can be expressed with a formula (33).

[0433]

f(x)=is+u (33)

[0434]When the mixture ratio alpha of a formula (13) and the sum of a foreground

ingredient are replaced using a formula (24) and a formula (29), the pixel value M is expressed with a formula (34).

[0435]

M = (jm+kq+p) and B+js+kt+u=jB−m+kB−q+B−p+j−s+k−t+u (34)

[0436]In a formula (34), a strange variable is six, the section p, s, and t of the horizontal inclination m to a field of the mixture ratio alpha, the inclination q to a perpendicular direction of a field of the mixture ratio alpha, and a field of the mixture ratio alpha, and u.

[0437]The mixture ratio alpha is computed by making it correspond to a pixel near the pixel currently observed, and solving two or more normal equations which set the pixel value M or the pixel value B as a normal equation showing in an equation (34) and with which the pixel value M or the pixel value B was set as it with a least square method.

[0438]For example, the horizontal index j of a pixel currently observed is set to 0, the vertical index k is set to 0, and if the pixel value M or the pixel value B is set as a normal equation showing in an equation (34) about a pixel of 3x3 near the pixel currently observed, an equation (35) thru/or an equation (43) will be obtained.

[0439]

$M_{-1 \text{ and } -1}$:=(−1) $-B_{-1 \text{ and } -1}$−m+(−1) $-B_{-1,\ -1}$ and q+$B_{-1,\text{ and } -1}$−p+(−1) −s+ (−1) and t+u (35)

−1=(0) and [$M_{0 \text{ and }}$] B0, and −1−m+(−1) −B0, −1 and q+B0, and −1−p+(0), s+ (−1), and t+u (36)

M+1 and −1=(+1) −B+1 and −1−m+(−1) −B+1, −1 and q+B+1, and −1−p+(+1) −s+ (−1) and t+u (37)

M−1, 0=(−1) −B−1, and 0−m+(0) and B−1, 0 and q+B−1, and 0−p+(−1) −s+(0) and t+u (38)

M0, 0=(0) and B0, and 0−m+(0) and B0, 0andq+B0, and 0−p+(0), s+(0), and t+u (39)

M+1, 0=(+1) −B+1, and 0−m+(0) and B+1, 0andq+B+1, and 0−p+(+1) −s+(0) and t+u (40)

M−1 and +1=(−1) −B−1 and +1−m+(+1) −B−1, +1 and q+B−1, and +1−p+(−1) −s+ (+1) and t+u (41)

$_{+1}$=(0) and [$M_{0 \text{ and }}$] B0, +1−m+(+1) −B0, +1andq+B0, and +1−p+(0), s+ (+1), and t+u (42)

M+1, +1=(+1) −B+1, +1−m+(+1) −B+1, +1andq+B+1, and +1−p+(+1) −s+ (+1) and t+u (43)

[0440]Since the horizontal index j of a pixel currently observed is 0 and the vertical index k is 0, the mixture ratio alpha of a pixel currently observed is more nearly equal to the value p at the time of j= 0 and k= 0, i.e., a section, than a formula (24).

[0441]Therefore, what is necessary is to compute the horizontal inclination m, the inclination q to a perpendicular direction, the section p, s, and t, and each value of u, and just to output the section p as the mixture ratio alpha with a least square method, based on nine formulas of a formula (35) thru/or a formula (43).

[0442]next —· applying a least square method —— the mixture ratio —— a concrete procedure is explained rather than computing alpha.

[0443]When the one index x expresses the index i and the index k, relation between the index i, the index k, and the index x is expressed with a formula (44).

[0444]

x=(j+1) and3+ (k+1) (44)

[0445]The horizontal inclination m, the inclination q to a perpendicular direction, the section p, s, and t, and u are expressed as the variable w0, w1, w2, w3, w4, and W5, respectively, and jB, kB, B, j, k, and 1 are expressed as a0, a1, a2, a3, a4, and a5, respectively. If the error ex is taken into consideration, a formula (35) thru/or a formula (43) can be rewritten at a ceremony (45).

[0446]

[Equation 12]

$$\mathbf{M}x = \sum_{y=0}^{5} ay \cdot wy + ex \qquad (45)$$

In a formula (45), x is one value of the integers of 0 thru/or 8.

[0447]A formula (46) can be drawn from a formula (45).

[0448]

[Equation 13]

$$ex = \mathbf{M}x - \sum_{y=0}^{5} ay \cdot wy \qquad (46)$$

[0449]Here, in order to apply a least square method, the sum of squares E with error is defined as being shown in a formula (47).

[0450]

[Equation 14]

$$\mathbf{E} = \sum_{x=0}^{8} ex^2 \qquad (47)$$

[0451]In order for an error to become the minimum, the partial differential of the variable Wv to the sum of squares E with error should just be set to 0. Here, v is one value of the integers of 0 thru/or 5. Therefore, wy is calculated so that a formula (48) may be filled.

[0452]

[Equation 15]

$$\frac{\partial \mathbf{E}}{\partial w\mathrm{v}} = 2 \cdot \sum_{x=0}^{8} ex \cdot \frac{\partial ex}{\partial w\mathrm{v}} = 2 \cdot \sum_{x=0}^{8} ex \cdot a\mathrm{v} = 0 \qquad (48)$$

[0453]A formula (49) will be obtained if a formula (46) is substituted for a formula (48).

[0454]

[Equation 16]

$$\sum_{x=0}^{8} \left(a\mathrm{v} \cdot \sum_{y=0}^{5} ay \cdot wy\right) = \sum_{x=0}^{8} a\mathrm{v} \cdot \mathbf{M}x \qquad (49)$$

[0455]wy is computed by sweeping out at six ceremony produced by substituting any one of the integers of 0 thru/or 5 for v of a formula (49), and applying law (elimination of Gauss-Jordan) etc. to it, for example. As mentioned above, w0 is the horizontal inclination m, w1 is the inclination q to a perpendicular direction, w2 is the section p, w3 is s, w4 is t, and w5 is u.

[0456]As mentioned above, it can ask for the horizontal inclination m, the inclination q to a perpendicular direction, the section p, s, and t, and u by applying a least square method to the formula which set up the pixel value M and the pixel value B.

[0457]Although the pixel value of the pixel contained in a mixing zone was set to M in the explanation corresponding to a formula (35) thru/or a formula (43) and the pixel value of the pixel contained in a background region was explained as B, When the pixel currently observed is contained in

a covered background region, it is necessary to each in the case of being contained in an uncovered background region to stand a normal equation.

[0458]For example, when asking for the mixture ratio alpha of a pixel contained in a covered background region of frame #n shown in drawing 74, the pixel values P04 thru/or P08 of a pixel of C04 thru/or C08, and frame #n-1 of a pixel of frame #n are set as a normal equation.

[0459]When asking for the mixture ratio alpha of a pixel contained in an uncovered background region of frame #n shown in drawing 75, the pixel values N28 thru/or N32 of a pixel of C28 thru/or C32, and frame #n+1 of a pixel of frame #n are set as a normal equation.

[0460]When, computing the mixture ratio alpha of a pixel contained in a covered background region shown in drawing 85 for example, the following formulas (50) thru/or formulas (58) is stood. the mixture ratio -- a pixel value of a pixel which computes alpha is Mc5.

[0461]

Mc1 = (-1), Bc1, m+ (-1), Bc1, q+Bc1, p+ (-1), s+ (-1), and t+u (50)

Mc2=(0), Bc2, m+ (-1), Bc2, q+Bc2, p+(0), s+ (-1), and t+u (51)

Mc3 = (+1), Bc3, m+ (-1), Bc3, q+Bc3, p+ (+1), s+ (-1), and t+u (52)

Mc4=(-1), Bc4, andm+ (0) -Bc4, q+Bc4, and p+(-1) -s+(0) and t+u (53)

Mc5= (0) Bc5 q+Bc5, -Bc5andm+ (0), and p+(0), s+(0), and t+u (54)

Mc6=(+1), Bc6, andm+ (0) -Bc6, q+Bc6, and p+(+1) -s+(0) and t+u (55)

Mc7 = (-1), Bc7, m+ (+1), Bc7, q+Bc7, p+ (-1), s+ (+1), and t+u (56)

Mc8=(0), Bc8 m+ (+1), Bc8, q+Bc8, p+(0), s+ (+1), and t+u (57)

Mc9 = (+1), Bc9, m+ (+1), Bc9, q+Bc9, p+ (+1), s+ (+1), and t+u (58)

[0462]When computing the mixture ratio alpha of a pixel contained in a covered background region of frame #n, in a formula (50) thru/or a formula (58), the pixel values Bc1 thru/or Bc9 of a pixel of a background region of a pixel of frame #n-1 corresponding to a pixel of frame #n are used.

[0463]When computing the mixture ratio alpha of a pixel contained in an uncovered background region shown in drawing 85, the following formulas (59) thru/or formulas (67) is stood. the mixture ratio -- a pixel value of a pixel which computes alpha is Mu5.

[0464]

Mu1 = (-1), Bu1, m+ (-1), Bu1, q+Bu1, p+ (-1), s+ (-1), and t+u (59)

Mu2=(0), Bu2 m+ (-1), Bu2, q+Bu2, p+(0), s+ (-1), and t+u (60)

Mu3 = (+1), Bu3, m+ (-1), Bu3, q+Bu3, p+ (+1), s+ (-1), and t+u (61)

Mu4=(-1), Bu4, andm+ (0) -Bu4, q+Bu4, and p+(-1) -s+(0) and t+u (62)

Mu5= (0) Bu5, q+Bu5, -Bu5andm+ (0), and p+(0), s+(0), and t+u (63)

Mu6=(+1), Bu6, andm+ (0) -Bu6, q+Bu6, and p+(+1) -s+(0) and t+u (64)

Mu7 = (-1), Bu7, m+ (+1), Bu7, q+Bu7, p+ (-1), s+ (+1), and t+u (65)

Mu8=(0), Bu8 m+ (+1), Bu8, q+Bu8, p+(0), s+ (+1), and t+u (66)

Mu9 = (+1), Bu9, m+ (+1), Bu9, q+Bu9, p+ (+1), s+ (+1), and t+u (67)

[0465]When computing the mixture ratio alpha of a pixel contained in an uncovered background region of frame #n, in a formula (59) thru/or a formula (67), the pixel values Bu1 thru/or Bu9 of a pixel of a background region of a pixel of frame #n+1 corresponding to a pixel of frame #n are used.

[0466]Drawing 86 is a block diagram showing composition of the presumed mixture ratio treating part 401. A picture inputted into the presumed mixture ratio treating part 401 is supplied to the delay part 501 and the help lump part 502.

[0467]The delay circuit 221 carries out 1 frame delay of the inputted image, is added, and is supplied to the lump part 502. When it adds and frame #n is inputted into the lump part 502 as an inputted image, the delay circuit 221 adds frame #n-1 and supplies it to the lump part 502.

[0468]It adds and the lump part 502 sets a pixel value of a pixel near the pixel which computes the mixture ratio alpha, and a pixel value of frame #n-1 as a normal equation. For example, it adds and the lump part 502 sets the pixel values Mc1 thru/or Mc9 and the pixel values Bc1 thru/or Bc9

as a normal equation based on an equation (50) thru/or an equation (58). It adds and the lump part 502 supplies a normal equation with which a pixel value was set up to the operation part 503.

[0469]The operation part 503 sweeps out a normal equation which added and was supplied from the lump part 502, solves it by law etc., asks for the presumed mixture ratio, and outputs the called-for presumed mixture ratio.

[0470]Thus, based on an inputted image, the presumed mixture ratio treating part 401 can compute the presumed mixture ratio, and can supply it to the mixture ratio deciding part 403.

[0471]Since it has the same composition as the presumed mixture ratio treating part 401, the presumed mixture ratio treating part 402 omits the explanation.

[0472]Drawing 87 is a figure showing an example of the presumed mixture ratio computed by the presumed mixture ratio treating part 401. The motion v of a foreground corresponding to an object which is moving at uniform velocity is 11, and the presumed mixture ratio shown in drawing 87 shows a result computed by having generated an equation to one line by making a 7x7-pixel block into a unit.

[0473]As the presumed mixture ratio is shown in drawing 86 in a mixing zone, it turns out that it is changing almost linearly.

[0474]Next, processing of mixture ratio presumption by a model corresponding to a covered background region by the presumed mixture ratio treating part 401 which shows drawing 86 composition is explained with reference to a flow chart of drawing 88.

[0475]In Step S521, it adds and the lump part 502 sets a pixel value included in an inputted picture, and a pixel value included in a picture supplied from the delay circuit 221 as a normal equation corresponding to a model of a covered background region.

[0476]In Step S522, when it judges whether setting out about the target pixel was completed and is judged with setting out about the target pixel not being completed, the presumed mixture ratio treating part 401 returns to Step S521, and repeats processing of setting out of a pixel value to a normal equation.

[0477]In Step S522, when judged with setting out of a pixel value about the target pixel having been completed, it progresses to Step S523, and based on a normal equation with which a pixel value was set up, the operation part 173 calculates the presumed mixture ratio, and outputs the called-for presumed mixture ratio.

[0478]Thus, the presumed mixture ratio treating part 401 which shows drawing 86 composition can calculate the presumed mixture ratio based on an inputted image.

[0479]Since processing of mixture ratio presumption by a model corresponding to an uncovered background region is the same as processing shown in a flow chart using a normal equation corresponding to a model of an uncovered background region of drawing 88, the explanation is omitted.

[0480]Although it explained that an object corresponding to a background was standing it still, processing which asks for the mixture ratio mentioned above even if a picture corresponding to a background region included a motion is applicable. For example, while a picture corresponding to a background region is moving uniformly, the presumed mixture ratio treating part 401 shifts the whole picture corresponding to this motion, and is processed like a case where an object corresponding to a background is standing it still. When a picture corresponding to a background region includes a different motion for every part, the presumed mixture ratio treating part 401 chooses a pixel corresponding to a motion as a pixel corresponding to a pixel belonging to a mixing zone, and performs above-mentioned processing.

[0481]thus, the mixture ratio which is the characteristic quantity corresponding to each pixel area information to which the mixture ratio calculation part 102 was supplied from the field specific part 101, and based on an inputted image -- alpha is computable.

[0482]the mixture ratio -- a motion included in a picture corresponding to an object which is moving by using alpha -- it becomes possible to separate an ingredient of a foreground and an ingredient of a background which are contained in a pixel value, with information on a Japanese quince left.

[0483]a right motion doubled with speed of an object which actually rephotoed the real world, and which is moving when combining a picture based on the mixture ratio alpha -- it becomes possible to make a picture containing a Japanese quince.

[0484]Next, the foreground background separation part 105 is explained. Drawing 89 is a block diagram showing an example of composition of the

foreground background separation part 105. An inputted image supplied to the foreground background separation part 105 is supplied to the separation part 601, the switch 602, and the switch 604. Area information supplied from the field specific part 103 which shows information which shows a covered background region, and an uncovered background region is supplied to the separation part 601. Area information which shows a foreground region is supplied to the switch 602. Area information which shows a background region is supplied to the switch 604.

[0485]the mixture ratio supplied from the mixture ratio calculation part 104 -- alpha is supplied to the separation part 601.

[0486]area information the separation part 601 indicates a covered background region to be, area information which shows an uncovered background region, and the mixture ratio -- an ingredient of a foreground from an inputted image based on alpha, [separate and] While supplying an ingredient of a separated foreground to the synchronizer 603, an ingredient of a background is separated from an inputted image and an ingredient of a separated background is supplied to the synchronizer 605.

[0487]When a pixel corresponding to a foreground is inputted based on area information which shows a foreground region, the switch 602 is closed and supplies only a pixel corresponding to a foreground included in an inputted image to the synchronizer 603.

[0488]When a pixel corresponding to a background is inputted based on area information which shows a background region, the switch 604 is closed and supplies only a pixel corresponding to a background included in an inputted image to the synchronizer 605.

[0489]Based on a pixel corresponding to a foreground supplied from an ingredient corresponding to a foreground supplied from the separation part 601, and the switch 602, the synchronizer 603 combines a foreground ingredient picture and outputs a compound foreground ingredient picture. Since a foreground region and a mixing zone do not overlap, the synchronizer 603 applies an operation of logical sum to an ingredient corresponding to a foreground, and a pixel corresponding to a foreground, and combines a foreground ingredient picture, for example.

[0490]In processing of initialization performed by the beginning of processing of composition of a foreground ingredient picture, all the pixel values store a picture which is 0 in a built-in frame memory, and the synchronizer 603 stores a foreground ingredient picture in it in processing of composition of a foreground ingredient picture (overwrite). Therefore, 0 is stored in a pixel corresponding to a background region as a pixel value among foreground ingredient pictures which the synchronizer 603 outputs.

[0491]Based on a pixel corresponding to a background supplied from an ingredient corresponding to a background supplied from the separation part 601, and the switch 604, the synchronizer 605 compounds a background component image and outputs a compound background component image. Since a background region and a mixing zone do not overlap, the synchronizer 605 applies an operation of logical sum to an ingredient corresponding to a background, and a pixel corresponding to a background, and compounds a background component image, for example.

[0492]In processing of initialization performed by the beginning of processing of composition of a background component image, all the pixel values store a picture which is 0 in a built-in frame memory, and the synchronizer 605 stores a background component image in it in processing of composition of a background component image (overwrite). Therefore, 0 is stored in a pixel corresponding to a foreground region as a pixel value among background component images which the synchronizer 605 outputs.

[0493]Drawing 90 is a figure showing a foreground ingredient picture and a background component image which are outputted from an inputted image inputted into the foreground background separation part 105, and the foreground background separation part 105.

[0494]Drawing 90 (A) is a mimetic diagram of a picture displayed, and drawing 90 (B) shows a model figure which developed a pixel of one line containing a pixel belonging to a foreground region corresponding to drawing 90 (A), a pixel belonging to a background region, and a pixel belonging to a mixing zone to a time direction.

[0495]As shown in drawing 90 (A) and drawing 90 (B), a background component image outputted from the foreground background separation part 105 comprises an ingredient of a background included in a pixel belonging to a background region, and a pixel of a mixing zone.

[0496]As shown in drawing 90 (A) and drawing 90 (B), a foreground ingredient picture outputted from the foreground background separation part 105 comprises an ingredient of a foreground included in a pixel belonging to a foreground region, and a pixel of a mixing zone.

[0497]A pixel value of a pixel of a mixing zone is divided into an ingredient of a background, and an ingredient of a foreground by the foreground background separation part 105. An ingredient of a separated background constitutes a background component image with a pixel belonging to a

background region. An ingredient of a separated foreground constitutes a foreground ingredient picture with a pixel belonging to a foreground region.

[0498]Thus, a pixel value to which a pixel value of a pixel corresponding to a background region in a foreground ingredient picture is set to 0, and a pixel corresponding to a foreground region and a pixel corresponding to a mixing zone have a meaning is set up. Similarly, a pixel value to which a pixel value of a pixel corresponding to a foreground region in a background component image is set to 0, and a pixel corresponding to a background region and a pixel corresponding to a mixing zone have a meaning is set up.

[0499]Next, processing which separates an ingredient of a foreground and an ingredient of a background from a pixel belonging to a mixing zone which the separation part 601 performs is explained.

[0500]Drawing 91 is a model of a picture in which an ingredient of a foreground of two frames and an ingredient of a background including a foreground corresponding to an object which moves to the right from the left in a figure are shown. In a model of a picture shown in drawing 91, movement quantity v of a foreground is 4 and the virtual number of partitions is set to 4.

[0501]In frame #n, leftmost pixel and the left to the 14th thru/or the 18th pixel comprise only an ingredient of a background, and belongs to a background region. In frame #n, the 2nd thru/or the 4th pixel belong to an uncovered background region including an ingredient of a background, and an ingredient of a foreground from the left. In frame #n, the 11th thru/or the 13th pixel belong to a covered background region including an ingredient of a background, and an ingredient of a foreground from the left. In frame #n, the left to the 5th thru/or the 10th pixel comprise only an ingredient of a foreground, and belongs to a foreground region.

[0502]In frame #n+1, the left to the 1st from the left thru/or the 5th pixel, and the 18th pixel comprise only an ingredient of a background, and belong to a background region. In frame #n+1, the 6th thru/or the 8th pixel belong to an uncovered background region including an ingredient of a background, and an ingredient of a foreground from the left. In frame #n+1, the 15th thru/or the 17th pixel belong to a covered background region including an ingredient of a background, and an ingredient of a foreground from the left. In frame #n+1, the left to the 9th thru/or the 14th pixel comprise only an ingredient of a foreground, and belongs to a foreground region.

[0503]Drawing 92 is a figure explaining processing which separates an ingredient of a foreground from a pixel belonging to a covered background region. In drawing 92, alpha1 thru/or alpha18 are the mixture ratio corresponding to ******** of a pixel in frame #n. In drawing 92, the 15th thru/or the 17th pixel belong to a covered background region from the left.

[0504]The pixel value C15 of the 15th pixel is expressed with a formula (68) from the left of frame #n.

[0505]

C15=B15/v+F09/v+F08/v+F07/v =alpha15 * B15+F09/v+F08/v+F07/v =alpha15 * P15+F09/v+F08/v+F07/v (68)

Here, alpha 15 is the mixture ratio of the 15th pixel from the left of frame #n. P15 is a pixel value of the 15th pixel from the left of frame #n-1.

[0506]Based on a formula (68), the sum f15 of an ingredient of a foreground of the 15th pixel is expressed with a formula (69) from the left of frame #n.

[0507]

f15=F09/v+F08/v+F07/v=C15-alpha15 * P15 (69)

[0508]Similarly, the sum f16 of an ingredient of a foreground of the 16th pixel is expressed with a formula (70) from the left of frame #n, and the sum f17 of an ingredient of a foreground of the 17th pixel is expressed with a formula (71) from the left of frame #n.

[0509]

f16=C16-alpha16 * P16 (70)

f17=C17-alpha17 * P17 (71)

[0510]Thus, the ingredient fc of a foreground included in the pixel value C of a pixel belonging to a covered background region is calculated by a formula (72).

[0511]

Fc=C-alpha*P (72)

P is a pixel value of a pixel to which a frame in front of one corresponds.

[0512]Drawing 93 is a figure explaining processing which separates an ingredient of a foreground from a pixel belonging to an uncovered background region. In drawing 93, alpha1 thru/or alpha18 are the mixture ratio corresponding to ******** of a pixel in frame #n. In drawing 93, the 2nd thru/or the 4th pixel belong to an uncovered background region from the left.

[0513]The pixel value C02 of the 2nd pixel is expressed with a formula (73) from the left of frame #n.

[0514]

C02=B02/v+E02/v+B02/v+F01/v=alpha2andB02+F01/v=alpha2andN02+F01/v (73)

Here, alpha 2 is the mixture ratio of the 2nd pixel from the left of frame #n. N02 is a pixel value of the 2nd pixel from the left of frame #n+1.

[0515]Based on a formula (73), the sum f02 of an ingredient of a foreground of the 2nd pixel is expressed with a formula (74) from the left of frame #n.

[0516]

f02=F01/v =C02-alpha2 and N02 (74)

[0517]Similarly, the sum f03 of an ingredient of a foreground of the 3rd pixel is expressed with a formula (75) from the left of frame #n, and the sum f04 of an ingredient of a foreground of the 4th pixel is expressed with a formula (76) from the left of frame #n.

[0518]

f03=C03-alpha3 and N03 (75)

f04=C04-alpha4 and N04 (76)

[0519]Thus, the ingredient fu of a foreground included in the pixel value C of a pixel belonging to an uncovered background region is calculated by a formula (77).

[0520]

Fu=C-alpha-N (77)

N is a pixel value of a pixel to which a frame after one corresponds.

[0521]Thus, the separation part 601 can separate an ingredient of a foreground, and an ingredient of a background from a pixel belonging to a mixing zone based on information which shows a covered background region included in area information, information which shows an uncovered background region, and the mixture ratio alpha for every pixel.

[0522]Drawing 94 is a block diagram showing an example of composition of the separation part 601 which performs processing explained above. The mixture ratio alpha is inputted into the separation block 622 at area information and a row which show a covered background region and an uncovered background region which a picture inputted into the separation part 601 was supplied to the frame memory 621, and were supplied from the mixture ratio calculation part 104.

[0523]The frame memory 621 memorizes an inputted picture per frame. The frame memory 621 memorizes frame #n+1 which is a frame after [of frame #n-1 which is a frame in front of / of frame #n / one, frame #n and frame #n] one, when an object of processing is frame #n.

[0524]The frame memory 621 supplies a pixel to which frame #n-1, frame #n, and frame #n+1 corresponds to the separation block 622.

[0525]Area information the separation block 622 indicates a covered background region and an uncovered background region to be, An operation explained to a pixel value of a pixel to which frame #n-1 supplied to row from frame memory 621 based on the mixture ratio alpha, frame #n, and frame #n+1 corresponds with reference to drawing 92 and drawing 93 is applied, An ingredient of a foreground and an ingredient of a background are separated from a pixel belonging to a mixing zone of frame #n, and the frame memory 623 is supplied.

[0526]The separation block 622 comprises the uncovered region processing part 631, the covered region processing part 632, the synchronizer 633, and the synchronizer 634.

[0527]A pixel value of a pixel of frame #n+1 to which the mixture ratio alpha was supplied from the frame memory 621 is multiplied by the multiplier 641 of the uncovered region processing part 631, and it is outputted to the switch 642. When a pixel (it corresponds to a pixel of frame #n+1) of

frame #n to which the switch 642 was supplied from the frame memory 621 is an uncovered background region, the mixture ratio which was closed and was supplied from the multiplier 641 -- a pixel value which multiplied by alpha is supplied to the computing unit 643 and the synchronizer 634. A value which multiplied a pixel value of a pixel of frame #n+1 outputted from the switch 642 by the mixture ratio alpha is equal to an ingredient of the background of a pixel value of a pixel that frame #n corresponds.

[0528]The computing unit 643 subtracts an ingredient of a background supplied from the switch 642 from a pixel value of a pixel of frame #n supplied from the frame memory 621, and asks for an ingredient of a foreground. The computing unit 643 supplies an ingredient of a foreground of a pixel of frame #n belonging to an uncovered background region to the synchronizer 633.

[0529]A pixel value of a pixel of frame #n-1 to which the mixture ratio alpha was supplied from the frame memory 621 is multiplied by the multiplier 651 of the covered region processing part 632, and it is outputted to the switch 652. When a pixel (it corresponds to a pixel of frame #n-1) of frame #n to which the switch 652 was supplied from the frame memory 621 is a covered background region, the mixture ratio which was closed and was supplied from the multiplier 651 -- a pixel value which multiplied by alpha is supplied to the computing unit 653 and the synchronizer 634. A value which multiplied a pixel value of a pixel of frame #n-1 outputted from the switch 652 by the mixture ratio alpha is equal to an ingredient of the background of a pixel value of a pixel that frame #n corresponds.

[0530]The computing unit 653 subtracts an ingredient of a background supplied from the switch 652 from a pixel value of a pixel of frame #n supplied from the frame memory 621, and asks for an ingredient of a foreground. The computing unit 653 supplies an ingredient of a foreground of a pixel of frame #n belonging to a covered background region to the synchronizer 633.

[0531]The synchronizer 633 compounds an ingredient of a foreground of a pixel belonging to a covered background region supplied from an ingredient of a foreground of a pixel belonging to an uncovered background region supplied from the computing unit 643 of frame #n, and the computing unit 653, and supplies it to the frame memory 623.

[0532]. The synchronizer 634 was supplied from the switch 642 of frame #n. An ingredient of the background of a pixel belonging to a covered background region supplied from an ingredient of the background of a pixel belonging to an uncovered background region and the switch 652 is compounded, and the frame memory 623 is supplied.

[0533]The frame memory 623 memorizes to each an ingredient of a foreground of a pixel of a mixing zone of frame #n supplied from the separation block 622, and an ingredient of a background.

[0534]The frame memory 623 outputs an ingredient of a foreground of a pixel of a mixing zone of memorized frame #n, and a memorized ingredient of the background of a pixel of a mixing zone of frame #n.

[0535]the mixture ratio which is characteristic quantity -- by using alpha, it becomes possible to separate thoroughly an ingredient of a foreground and an ingredient of a background which are contained in a pixel value.

[0536]The synchronizer 603 compounds an ingredient of a foreground of a pixel of a mixing zone of frame #n outputted from the separation part 601, and a pixel belonging to a foreground region, and generates a foreground ingredient picture. The synchronizer 605 compounds an ingredient of the background of a pixel of a mixing zone of frame #n outputted from the separation part 601, and a pixel belonging to a background region, and generates a background component image.

[0537]Drawing 95 is a figure showing an example of a foreground ingredient picture corresponding to frame #n of drawing 91, and an example of a background component image.

[0538]Drawing 95 (A) shows an example of a foreground ingredient picture corresponding to frame #n of drawing 91. From leftmost pixel and the left, since the 14th pixel comprised only an ingredient of a background before a foreground and a background were separated, a pixel value is set to 0.

[0539]Before a foreground and a background are separated from the left as for the 2nd thru/or the 4th pixel, it belongs to an uncovered background region, an ingredient of a background is set to 0, and an ingredient of a foreground is left behind as it is. Before a foreground and a background are separated from the left as for the 11th thru/or the 13th pixel, it belongs to a covered background region, an ingredient of a background is set to 0, and an ingredient of a foreground is left behind as it is. From the left, since only an ingredient of a foreground is comprised, the 5th thru/or the 10th

pixel are left behind as it is.

[0540]Drawing 95 (B) shows an example of a background component image corresponding to frame #n of drawing 91. From leftmost pixel and the left, since only an ingredient of a background was comprised before a foreground and a background were separated, the 14th pixel is left behind as it is.

[0541]Before a foreground and a background are separated from the left as for the 2nd thru/or the 4th pixel, it belongs to an uncovered background region, an ingredient of a foreground is set to 0, and an ingredient of a background is left behind as it is. Before a foreground and a background are separated from the left as for the 11th thru/or the 13th pixel, it belongs to a covered background region, an ingredient of a foreground is set to 0, and an ingredient of a background is left behind as it is. From the left, since the 5th thru/or the 10th pixel comprised only an ingredient of a foreground before a foreground and a background were separated, a pixel value is set to 0.

[0542]Next, with reference to a flow chart shown in drawing 96, processing of separation with a foreground and a background by the foreground background separation part 105 is explained. In Step S601, the frame memory 621 of the separation part 601 acquires an inputted image, and memorizes frame #n which is the target [background / a foreground and] of separation with frame #n-1 before that, and frame #n+1 of after that.

[0543]In Step S602, the separation block 622 of the separation part 601 acquires area information supplied from the mixture ratio calculation part 104. the mixture ratio to which the separation block 622 of the separation part 601 was supplied from the mixture ratio calculation part 104 in Step S603 -- alpha is acquired.

[0544]in Step S604 -- the uncovered region processing part 631 -- area information and the mixture ratio -- an ingredient of a background is extracted from a pixel value of a pixel which belongs based on alpha in an uncovered background region supplied from the frame memory 621.

[0545]in Step S605 -- the uncovered region processing part 631 -- area information and the mixture ratio -- an ingredient of a foreground is extracted from a pixel value of a pixel which belongs based on alpha in an uncovered background region supplied from the frame memory 621.

[0546]in Step S606 -- the covered region processing part 632 -- area information and the mixture ratio -- an ingredient of a background is extracted from a pixel value of a pixel which belongs based on alpha in a covered background region supplied from the frame memory 621.

[0547]in Step S607 -- the covered region processing part 632 -- area information and the mixture ratio -- an ingredient of a foreground is extracted from a pixel value of a pixel which belongs based on alpha in a covered background region supplied from the frame memory 621.

[0548]In Step S608, the synchronizer 633 compounds an ingredient of a foreground of a pixel belonging to an uncovered background region extracted by processing of Step S605, and an ingredient of a foreground of a pixel belonging to a covered background region extracted by processing of Step S607. An ingredient of a compounded foreground is supplied to the synchronizer 603. The synchronizer 603 compounds a pixel belonging to a foreground region supplied via the switch 602, and an ingredient of a foreground supplied from the separation part 601, and generates a foreground ingredient picture.

[0549]In Step S609, the synchronizer 634 compounds an ingredient of the background of a pixel belonging to an uncovered background region extracted by processing of Step S604, and an ingredient of the background of a pixel belonging to a covered background region extracted by processing of Step S606. An ingredient of a compounded background is supplied to the synchronizer 605. The synchronizer 605 compounds a pixel belonging to a background region supplied via the switch 604, and an ingredient of a background supplied from the separation part 601, and generates a background component image.

[0550]In Step S610, the synchronizer 603 outputs a foreground ingredient picture. In Step S611, the synchronizer 605 outputs a background component image and ends processing.

[0551]thus, the foreground background separation part 105 -- area information and the mixture ratio -- based on alpha, an ingredient of a foreground and an ingredient of a background can be separated from an inputted image, and a foreground ingredient picture which comprises only an ingredient of a foreground, and a background component image which comprises only an ingredient of a background can be outputted.

[0552]Next, a foreground ingredient picture moves and adjustment of quantity of a Japanese quince is explained.

[0553]Drawing 97 is a block diagram showing an example of composition of the motion dotage controller 106. A motion vector supplied from the

motion detection part 102 and its position information are supplied to the batch deciding part 801, the modeling part 802, and the operation part 805. Area information supplied from the field specific part 103 is supplied to the batch deciding part 801. A foreground ingredient picture supplied from the foreground background separation part 105 is added, and is supplied to the lump part 804.

[0554]Based on a motion vector, its position information, and area information, the batch deciding part 801 generates a batch and supplies a generated batch to the modeling part 802 and the help lump part 804.

[0555]A batch which the batch deciding part 801 generates, As an example is shown in drawing 98, it begins from a pixel corresponding to a covered background region of a foreground ingredient picture, It begins from a continuous pixel located in a line in the motion direction to a pixel corresponding to an uncovered background region, or a pixel corresponding to an uncovered background region, and a continuous pixel located in a line in the motion direction to a pixel corresponding to a covered background region is shown. A batch comprises two data, a top left point (position of a pixel which is a pixel specified by a batch and is located in the leftmost or the top on a picture), and a lower right point, for example.

[0556]The modeling part 802 performs modeling based on a motion vector and an inputted batch. More specifically, for example the modeling part 802, Two or more models corresponding to the number of pixels contained in a batch, the virtual number of partitions of a time direction of a pixel value, and the number of ingredients of a foreground for every pixel are memorized beforehand, A model which specifies correspondence with a pixel value as shown in drawing 99, and an ingredient of a foreground is chosen based on a batch and the virtual number of partitions of a time direction of a pixel value.

[0557][for example, / when the number of pixels corresponding to a batch is 12 and movement quantity v within shutter time is 5], The modeling part 802 sets the virtual number of partitions to 5, and a pixel located in the leftmost contains an ingredient of one foreground, The 2nd pixel contains an ingredient of two foregrounds from the left, and the 3rd pixel contains an ingredient of three foregrounds from the left, The 4th pixel contains an ingredient of four foregrounds from the left, and the 5th pixel contains an ingredient of five foregrounds from the left, The 6th pixel contains an ingredient of five foregrounds from the left, and the 7th pixel contains an ingredient of five foregrounds from the left, The 8th pixel contains an ingredient of five foregrounds from the left, and the 9th pixel contains an ingredient of four foregrounds from the left, In the left to the 12th pixel, the left to the 11th pixel chooses [the 10th pixel] from the left a model which comprises an ingredient of eight foregrounds as a whole including an ingredient of one foreground including an ingredient of two foregrounds including an ingredient of three foregrounds.

[0558]When it does not choose from a model memorized beforehand but a motion vector and a batch are supplied, it may be made for the modeling part 802 to generate a model based on a motion vector and a batch.

[0559]The modeling part 802 supplies a selected model to the equation generation part 803.

[0560]The equation generation part 803 generates an equation based on a model supplied from the modeling part 802. With reference to a model of a foreground ingredient picture shown in drawing 99, the number of ingredients of a foreground is 8, the number of pixels corresponding to a batch is 12, movement quantity v is 5 and an equation which the equation generation part 803 in case the virtual number of partitions is 5 generates is explained.

[0561]When foreground ingredients corresponding to the shutter time/v contained in a foreground ingredient picture are F01/v thru/or F08/v, relation between F01/v thru/or F08/v, and the pixel values C01 thru/or C12 is expressed with a formula (78) thru/or a formula (89).

[0562]

C01=F01/v (78)

C02=F02/v+F01/v (79

C03=F03/v+F02/v+F01/v (80)

C04=F04/v+F03/v+F02/v+F01/v (81)

C05=F05/v+F04/v+F03/v+F02/v+F01/v (82)

C06=F06/v+F05/v+F04/v+F03/v+F02/v (83)

C07=F07/v+F06/v+F05/v+F04/v+F03/v (84)

C08=F08/v+F07/v+F06/v+F05/v+F04/v (85)

C09=F08/v+F07/v+F06/v+F05/v (86)

C10=F08/v+F07/v+F06/v (87)

C11=F08/v+F07/v (88

C12=F08/v (89)

[0563]The equation generation part 803 transforms a generated equation, and generates an equation. An equation which the equation generation part 803 generates is shown in an equation (90) thru/or an equation (101).

[0564]

F06 [C01=1 and F01/v+0 and F02/v+0 and F03/v+0 and F04/v+0 and F05/v+0 and]/v+0 and F07/v+0 and F08 / v (90)

F06 [C02=1 and F01/v+1 and F02/v+0 and F03/v+0 and F04/v+0 and F05/v+0 and]/v+0 and F07/v+0 and F08 / v (91)

F06 [C03=1 and F01/v+1 and F02/v+1 and F03/v+0 and F04/v+0 and F05/v+0 and]/v+0 and F07/v+0 and F08 / v (92)

F06 [C04=1 and F01/v+1 and F02/v+1 and F03/v+1 and F04/v+0 and F05/v+0 and]/v+0 and F07/v+0 and F08 / v (93)

F06 [C05=1 and F01/v+1 and F02/v+1 and F03/v+1 and F04/v+1 and F05/v+0 and]/v+0 and F07/v+0 and F08 / v (94)

F06 [C06=0 and F01/v+1 and F02/v+1 and F03/v+1 and F04/v+1 and F05/v+1 and]/v+0 and F07/v+0 and F08 / v (95)

F06 [C07=0 and F01/v+0 and F02/v+1 and F03/v+1 and F04/v+1 and F05/v+1 and]/v+1 and F07/v+0 and F08 / v (96)

F06 [C08=0 and F01/v+0 and F02/v+0 and F03/v+1 and F04/v+1 and F05/v+1 and]/v+1 and F07/v+1 and F08 / v (97)

F06 [C09=0 and F01/v+0 and F02/v+0 and F03/v+0 and F04/v+1 and F05/v+1 and]/v+1 and F07/v+1 and F08 / v (98)

F06 [C10=0 and F01/v+0 and F02/v+0 and F03/v+0 and F04/v+0 and F05/v+1 and]/v+1 and F07/v+1 and F08 / v (99)

F06 [C11=0 and F01/v+0 and F02/v+0 and F03/v+0 and F04/v+0 and F05/v+0 and]/v+1 and F07/v+1 and F08 / v (100)

F06 [C12=0 and F01/v+0 and F02/v+0 and F03/v+0 and F04/v+0 and F05/v+0 and]/v+0 and F07/v+1 and F08 / v (101)

[0565]A formula (90) thru/or a formula (101) can also be expressed as a formula (102).

[0566]

[Equation 17]

$$Cj = \sum_{i=01}^{08} aij \cdot Fi/v \qquad (102)$$

In a formula (02), j shows the position of a pixel. In this example, j has any one value of 1 thru/or 12. i shows the position of a foreground value. In this example, i has any one value of 1 thru/or 8. aij has a value of 0 or 1 corresponding to the value of i and j.

[0567]If it expresses in consideration of an error, a formula (102) can be expressed like a formula (103).

[0568]

[Equation 18]

$$Cj = \sum_{i=01}^{08} aij \cdot Fi/v + ej \qquad (103)$$

In a formula (103), ej is an error included in the noticed picture element Cj.

[0569]A formula (103) can be rewritten at a ceremony (104).

[0570]

[Equation 19]

$$ej = Cj - \sum_{i=01}^{08} aij \cdot Fi/v \qquad (104)$$

[0571]Here, in order to apply a least square method, the sum of squares E with error is defined as shown in a formula (105).

[0572]

[Equation 20]

$$E = \sum_{j=01}^{12} ej^{2} \qquad (105)$$

[0573]In order for an error to become the minimum, the value of the partial differential by the variable Fk to the sum of squares E with error should just be set to 0. Fk is calculated so that a formula (106) may be filled.

[0574]

[Equation 21]

$$\frac{\partial E}{\partial Fk} = 2 \cdot \sum_{j=01}^{12} ej \cdot \frac{\partial ej}{\partial Fk}$$

$$= 2 \cdot \sum_{j=01}^{12} \{(Cj - \sum_{i=01}^{08} aij \cdot Fi/v) \cdot (-akj/v) = 0 \qquad (106)$$

[0575]In a formula (106), since movement quantity v is a fixed value, it can draw a formula (107).

[0576]

[Equation 22]

$$\sum_{j=01}^{12} akj \cdot (Cj - \sum_{i=01}^{08} aij \cdot Fi/v) = 0 \qquad (107)$$

[0577]A formula (108) will be obtained if a formula (107) is developed and transposed.

[0578]

[Equation 23]

$$\sum_{j=01}^{12} (akj \cdot \sum_{i=01}^{08} aij \cdot Fi) = v \cdot \sum_{j=01}^{12} akj \cdot Cj \qquad (108)$$

[0579]It develops at eight ceremony produced by substituting any one of the integers of 1 thru/or 8 for k of a formula (108). One formula can express eight obtained formulas by a procession. This equation is called a normal equation.

[0580]An example of a normal equation which the equation generation part 803 generates based on such a least square method is shown in an equation (109).

[0581]

[Equation 24]

$$\begin{bmatrix} 5 & 4 & 3 & 2 & 1 & 0 & 0 & 0 \\ 4 & 5 & 4 & 3 & 2 & 1 & 0 & 0 \\ 3 & 4 & 5 & 4 & 3 & 2 & 1 & 0 \\ 2 & 3 & 4 & 5 & 4 & 3 & 2 & 1 \\ 1 & 2 & 3 & 4 & 5 & 4 & 3 & 2 \\ 0 & 1 & 2 & 3 & 4 & 5 & 4 & 3 \\ 0 & 0 & 1 & 2 & 3 & 4 & 5 & 4 \\ 0 & 0 & 0 & 1 & 2 & 3 & 4 & 5 \end{bmatrix} \begin{bmatrix} F01 \\ F02 \\ F03 \\ F04 \\ F05 \\ F06 \\ F07 \\ F08 \end{bmatrix} = v \cdot \begin{bmatrix} \sum_{i=08}^{12} Ci \\ \sum_{i=07}^{11} Ci \\ \sum_{i=06}^{10} Ci \\ \sum_{i=05}^{09} Ci \\ \sum_{i=04}^{08} Ci \\ \sum_{i=03}^{07} Ci \\ \sum_{i=02}^{06} Ci \\ \sum_{i=01}^{05} Ci \end{bmatrix} \quad (109)$$

[0582]If a formula (109) is expressed as A-F=v-C, C, A, and v are known and F is strange. Although A and v are known at the time of modeling, C becomes known in adding and inputting a pixel value in lump operation.

[0583]The error included in the pixel C can be distributed by computing a foreground ingredient with the normal equation based on a least square method.

[0584]The equation generation part 803 adds a normal equation generated in this way, and supplies it to the lump part 804.

[0585]It adds and the lump part 804 sets the pixel value C included in a foreground ingredient picture as an equation of a procession supplied from the equation generation part 803 based on a batch supplied from the batch deciding part 801. It adds and the lump part 804 supplies a procession which set up the pixel value C to the operation part 805.

[0586]The operation part 805 sweeps out and by processing based on solutions, such as law (elimination of Gauss-Jordan). a motion -- computing foreground ingredient Fi/v from which a Japanese quince was removed -- a motion -- Fi corresponding to one i of the integers of 0 thru/or 8 which is a pixel value of a foreground where a Japanese quince was removed, [compute and] It moves and a foreground ingredient picture which shows drawing 100 an example, which comprises Fi which is the pixel value from which it moved and a Japanese quince was removed and from which it moved and a Japanese quince was removed is outputted to the Japanese quince adjunct 806 and the selecting part 807.

[0587]a motion shown in drawing 100 -- C03 thru/or C10 are alike, respectively, each of F01 thru/or F08 is set up in order not to change a position of a foreground ingredient picture over a screen, and it can be made to correspond to arbitrary positions in a foreground ingredient picture from which a Japanese quince was removed

[0588]a motion -- a Japanese quince -- a motion of a value in which the adjunct 806 differs from movement quantity v -- a Japanese quince -- a motion of a value of a half of amount of adjustments v', for example, movement quantity v, -- a Japanese quince -- a motion of amount of adjustments v' and a value unrelated to movement quantity v -- a Japanese quince -- giving amount of adjustments v' -- a motion -- quantity of a Japanese quince can be adjusted. for example, it is shown in Drawing 101 -- as -- a motion -- a Japanese quince -- the adjunct 806 -- a motion -- moving the pixel value Fi of a foreground where a Japanese quince was removed -- amount of Japanese quince adjustments v' -- **** -- computing the sum of foreground ingredient Fi/v' by computing foreground ingredient Fi/v' by things -- a motion -- a pixel value to which quantity of a Japanese quince was adjusted is generated. For example, when amount of motion dotage adjustments v' is 3, the pixel value C02 is made into (F01) / v', the pixel value C03 is made into (F01+F02) / v', the pixel value C04 is made into (F01+F02+F03) / v', and the pixel value C05 is made into (F02+F03+F04) / v'.

[0589]The motion dotage adjunct 806 supplies a foreground ingredient picture which moved and adjusted quantity of a Japanese quince to the selecting part 807.

[0590]A foreground ingredient picture from which the selecting part 807 was supplied [picture] from the operation part 805, for example based on a selection signal corresponding to a user's selection, it moved, and a Japanese quince was removed, And either of the foreground ingredient pictures to which were supplied from the motion dotage adjunct 806, it moved, and quantity of a Japanese quince was adjusted is chosen, and a selected foreground ingredient picture is outputted.

[0591]Thus, based on selection signal and amount of motion dotage adjustments v', the motion dotage controller 106 can be moved and can adjust quantity of a Japanese quince.

[0592]For example, as shown in Drawing 102, when the number of pixels corresponding to a batch is 8 and movement quantity v is 4, the motion dotage controller 106 generates a formula of a procession shown in a formula (110).

[0593]

[Equation 25]

$$\begin{bmatrix} 4 & 3 & 2 & 1 & 0 \\ 3 & 4 & 3 & 2 & 1 \\ 2 & 3 & 4 & 3 & 2 \\ 1 & 2 & 3 & 4 & 3 \\ 0 & 1 & 2 & 3 & 4 \end{bmatrix} \begin{bmatrix} F01 \\ F02 \\ F03 \\ F04 \\ F05 \end{bmatrix} = v \cdot \begin{bmatrix} \sum_{i=05}^{08} Ci \\ \sum_{i=04}^{07} Ci \\ \sum_{i=03}^{06} Ci \\ \sum_{i=02}^{05} Ci \\ \sum_{i=01}^{04} Ci \end{bmatrix} \qquad (110)$$

[0594]The motion dotage controller 106 computes Fi which is the pixel value to which the formula of the number corresponding to the length of the batch was stood in this way, it moved, and the quantity of the Japanese quince was adjusted. When similarly there is the 100 number of the pixels contained in a batch, for example, Fi is computed by generating the formula corresponding to 100 pixels.

[0595]Drawing 103 is a figure showing other composition of the motion dotage controller 106. The same number is given to the same portion as the case where it is shown in drawing 97, and the explanation is omitted.

[0596]. [whether the selecting part 821 supplies an inputted motion vector and its position signal to the batch deciding part 801 and the modeling part 802 as it is based on a selection signal, and] Or a motion vector which moved, transposed a size of a motion vector to amount of Japanese quince adjustments v', and the size moved and was transposed to amount of Japanese quince adjustments v', and its position signal are supplied to the batch deciding part 801 and the modeling part 802.

[0597]doing in this way -- a motion of Drawing 103 — a Japanese quince -- the batch deciding part 801 thru/or the operation part 805 of the controller 106 moves with movement quantity v, and corresponds to a value with amount of Japanese quince adjustments v' -- a motion -- quantity of a Japanese quince can be adjusted. For example, when amount of Japanese quince adjustments v' is 3, movement quantity v is 5, move, and Drawing 103 moves, and the batch deciding part 801 thru/or the operation part 805 of the Japanese quince controller 106, a motion whose movement quantity v shown in drawing 99 is 3 to a foreground ingredient picture which is 5 -- a Japanese quince -- amount of adjustments v' -- a motion according to a model as shown in corresponding Drawing 101, perform an operation, and corresponding to (movement quantity v)/(motion Japanese quince amount of adjustments v') =5 / 3, i.e., movement quantity v of about 1.7, -- a picture containing a Japanese quince is computed. a motion corresponding to movement quantity v whose picture computed in this case is 3 -- since a Japanese quince is not included — a motion -- a Japanese quince -- cautions are required for a point that move with movement quantity v and implications of a relation of amount of Japanese

quince adjustments v' differ from a result of the adjunct 806.

[0598]As mentioned above, the motion dotage controller 106 computes a foreground ingredient picture to which a pixel value of a foreground ingredient picture was set as a formula which generated and generated a formula, it moved to it corresponding to movement quantity v and a batch, and quantity of a Japanese quince was adjusted.

[0599]Next, with reference to a flow chart of Drawing 104, it moves, and it is contained in a foreground ingredient picture by the Japanese quince controller 106 and moves, and processing of adjustment of quantity of a Japanese quince is explained.

[0600]In Step S801, it moves and the batch deciding part 801 of the Japanese quince controller 106 supplies a batch which generated and generated a batch to the modeling part 802 based on a motion vector and area information.

[0601]In Step S802, it moves and the modeling part 802 of the Japanese quince controller 106 performs selection and generation of a model corresponding to movement quantity v and a batch. In Step S803, the equation generation part 803 creates a normal equation based on a selected model.

[0602]In Step S804, it adds and the lump part 804 sets a pixel value of a foreground ingredient picture as a created normal equation. In Step S805, add and the lump part 804, When it judges whether a pixel value of all the pixels corresponding to a batch was set up and judged with setting up no pixel value of pixels corresponding to a batch, it returns to Step S804 and processing of setting out of a pixel value to a normal equation is repeated.

[0603]When judged with having set up a pixel value of all the pixels of a batch in Step S805, progress to Step S806 and the operation part 805, A pixel value of a foreground which moved based on a normal equation with which a pixel value which added and was supplied from the lump part 804 was set up, and adjusted quantity of a Japanese quince to it is computed, and processing is ended.

[0604]Thus, the motion dotage controller 106 can adjust quantity of a foreground-image lost-motion Japanese quince which moves and contains a Japanese quince based on a motion vector and area information.

[0605]That is it can be contained in a pixel value which is sample data, and can move, and quantity of a Japanese quince can be adjusted.

[0606]Drawing 105 is a block diagram showing other examples of composition of the motion dotage controller 106. Area information which a motion vector supplied from the motion detection part 102 and its position information were supplied to the batch deciding part 901 and the amendment part 905, and was supplied from the field specific part 103 is supplied to the batch deciding part 901. A foreground ingredient picture supplied from the foreground background separation part 105 is supplied to the operation part 904.

[0607]The batch deciding part 901 supplies a batch which generated a batch and was generated with a motion vector to the modeling part 902 based on a motion vector, its position information, and area information.

[0608]The modeling part 902 performs modeling based on a motion vector and an inputted batch. More specifically, for example the modeling part 902, Two or more models corresponding to the number of pixels contained in a batch, the virtual number of partitions of a time direction of a pixel value, and the number of ingredients of a foreground for every pixel are memorized beforehand, A model which specifies correspondence with a pixel value as shown in Drawing 106, and an ingredient of a foreground is chosen based on a batch and the virtual number of partitions of a time direction of a pixel value.

[0609][for example, / when the number of pixels corresponding to a batch is 12 and movement quantity v is 5], The modeling part 902 sets the virtual number of partitions to 5, and a pixel located in the leftmost contains an ingredient of one foreground, The 2nd pixel contains an ingredient of two foregrounds from the left, and the 3rd pixel contains an ingredient of three foregrounds from the left, The 4th pixel contains an ingredient of four foregrounds from the left, and the 5th pixel contains an ingredient of five foregrounds from the left, The 6th pixel contains an ingredient of five foregrounds from the left, and the 7th pixel contains an ingredient of five foregrounds from the left, The 8th pixel contains an ingredient of five foregrounds from the left, and the 9th pixel contains an ingredient of four foregrounds from the left, In the left to the 12th pixel, the left to the 11th pixel chooses [the 10th pixel] from the left a model which comprises an ingredient of eight foregrounds as a whole including an ingredient of one foreground including an ingredient of two foregrounds including an ingredient of three foregrounds.

[0610]When it does not choose from a model memorized beforehand but a motion vector and a batch are supplied, it may be made for the modeling

part 902 to generate a model based on a motion vector and a batch.

[0611]The equation generation part 903 generates an equation based on a model supplied from the modeling part 902.

[0612]With reference to a model of a foreground ingredient picture shown in Drawing 106 thru/or Drawing 108, the number of ingredients of a foreground is 8, the number of pixels corresponding to a batch is 12, and an example of an equation which the equation generation part 903 in case movement quantity v is 5 generates is explained.

[0613]When foreground ingredients corresponding to the shutter time/v contained in a foreground ingredient picture are F01/v thru/or F08/v, relation between F01/v thru/or F08/v, and the pixel values C01 thru/or C12 is expressed with a formula (78) thru/or a formula (89) as mentioned above.

[0614]When the pixel values C12 and C11 are observed, as the pixel value C12 is shown in a formula (111), the pixel value C11 comprises sum of products of the ingredients F08/v of a foreground, and the ingredients F07/v of a foreground only including the ingredients F08/v of a foreground. Therefore, it can ask for the ingredients F07/v of a foreground by a formula (112).

[0615]

F08/v=C12 (111)

F07/v=C11-C12 (112)

[0616]If similarly an ingredient of a foreground included in the pixel values C10 thru/or C01 is taken into consideration, it can ask for the ingredients F06/v of a foreground thru/or F01/v by formula (113) thru/or a formula (118).

[0617]

F06/v=C10-C11 (113)

F05/v=C09-C10 (114)

F04/v=C08-C09 (115)

F03/v=C07-C08+C12 (116)

F02/v=C06-C07+C11-C12 (117)

F01/v=C05-C06+C10-C11 (118)

[0618]The equation generation part 903 generates an equation for computing an ingredient of a foreground according to a difference of a pixel value showing an example at an equation (111) thru/or a ceremony (118). The equation generation part 903 supplies a generated equation to the operation part 904.

[0619]The operation part 904 computes an ingredient of a foreground based on an equation which set a pixel value of a foreground ingredient picture as an equation supplied from the equation generation part 903, and set up a pixel value. The operation part 904 sets the pixel values C05 thru/or C12 as an equation (111) thru/or an equation (118), for example, when an equation (111) thru/or an equation (118) are supplied from the equation generation part 903.

[0620]The operation part 904 computes an ingredient of a foreground based on a formula to which a pixel value was set. For example, by the operation based on a formula (111) thru/or a formula (118) to which the pixel values C05 thru/or C12 were set, the operation part 904 computes the ingredients F01/v of a foreground thru/or F08/v, as shown in Drawing 107. The operation part 904 supplies the ingredients F01/v of a foreground thru/or F08/v to the amendment part 905.

[0621]The amendment part 905 computes a pixel value of a foreground which multiplied by movement quantity v contained in an ingredient of a foreground supplied from the operation part 904 at a motion vector supplied from the batch deciding part 901, moved, and removed a Japanese quince. For example, when the ingredients F01/v of a foreground to which the amendment part 905 was supplied from the operation part 904 thru/or F08/v are supplied, By multiplying the ingredients F01/v of a foreground thru/or each of F08/v by movement quantity v which is 5, as shown in Drawing 108, the pixel values F01 thru/or F08 of a foreground which moved and removed a Japanese quince are computed.

[0622]The amendment part 905 moves and supplies a foreground ingredient picture which was computed as mentioned above and which comprises

a pixel value of a foreground which moved and removed a Japanese quince to the Japanese quince adjunct 906 and the selecting part 907.

[0623]a motion -- a Japanese quince -- a motion of a value in which the adjunct 906 differs from movement quantity v -- a Japanese quince -- a motion of a value of a half of amount of adjustments v', for example, movement quantity v, -- a Japanese quince -- a motion of a value unrelated to amount of adjustments v' and movement quantity v -- a Japanese quince -- it is amount of adjustments v' -- a motion -- quantity of a Japanese quince can be adjusted. for example, it is shown in Drawing 101 -- as -- a motion -- a Japanese quince -- the adjunct 906 -- a motion -- moving the pixel value Fi of a foreground where a Japanese quince was removed -- amount of Japanese quince adjustments v' -- **** -- computing the sum of foreground ingredient Fi/v' by computing foreground ingredient Fi/v' by things -- a motion -- a pixel value to which quantity of a Japanese quince was adjusted is generated. For example, when amount of motion dotage adjustments v' is 3, the pixel value C02 is made into (F01) / v', the pixel value C03 is made into (F01+F02) / v', the pixel value C04 is made into (F01+F02+F03) / v', and the pixel value C05 is made into (F02+F03+F04) / v'.

[0624]The motion dotage adjunct 906 supplies a foreground ingredient picture which moved and adjusted quantity of a Japanese quince to the selecting part 907.

[0625]A foreground ingredient picture from which the selecting part 907 was supplied [picture] from the amendment part 905, for example based on a selection signal corresponding to a user's selection, it moved, and a Japanese quince was removed, And either of the foreground ingredient pictures to which were supplied from the motion dotage adjunct 906, it moved, and quantity of a Japanese quince was adjusted is chosen, and a selected foreground ingredient picture is outputted.

[0626]Thus, based on selection signal and amount of motion dotage adjustments v', the motion dotage controller 106 can be moved and can adjust quantity of a Japanese quince.

[0627]Next, a foreground which shows composition in Drawing 105 move and according to the Japanese quince controller 106 moves, and processing of adjustment of quantity of a Japanese quince is explained with reference to a flow chart of Drawing 109.

[0628]In Step S901, it moves and the batch deciding part 901 of the Japanese quince controller 106 supplies a batch which generated and generated a batch to the modeling part 902 and the amendment part 905 based on a motion vector and area information.

[0629]In Step S902, it moves and the modeling part 902 of the Japanese quince controller 106 performs selection and generation of a model corresponding to movement quantity v and a batch. In Step S903, the equation generation part 903 generates an equation for computing an ingredient of a foreground according to a difference of a pixel value of a foreground ingredient picture based on a model chosen or generated.

[0630]In Step S904, the operation part 904 extracts an ingredient of a foreground from difference of a pixel value based on an equation which set a pixel value of a foreground ingredient picture as a created equation and with which a pixel value was set up. In Step S905, when it judges whether an ingredient of all the foregrounds corresponding to a batch was extracted and is judged with extracting no ingredient of foregrounds corresponding to a batch, the operation part 904 returns to Step S904, and repeats processing of extraction of an ingredient of a foreground.

[0631]When judged with having extracted an ingredient of all the foregrounds corresponding to a batch in Step S905, progress to Step S906 and the amendment part 905, The pixel values F01 thru/or F08 of a foreground which amended the ingredients F01/v of a foreground thru/or each of F08/v which was supplied from the operation part 904 based on movement quantity v, moved to it, and removed a Japanese quince are computed.

[0632]in Step S907 -- a motion -- a Japanese quince -- the adjunct 906 -- a motion -- computing a pixel value of a foreground which adjusted quantity of a Japanese quince -- the selecting part 907 -- a motion -- a picture or a motion from which a Japanese quince was removed -- either of the pictures to which quantity of a Japanese quince was adjusted is chosen, a selected picture is outputted and processing is ended.

[0633]Thus, a foreground-image lost-motion Japanese quince which is an operation with the easier Japanese quince controller 106 when composition is shown in Drawing 105, and which moves, moves more nearly promptly, and contains a Japanese quince can be adjusted.

[0634]the conventional motions, such as a Wiener filter, -- although an effect is accepted in an ideal state, the technique of removing a Japanese quince selectively, a motion which shows composition in Drawing 105 to sufficient effect not being acquired to a actual picture which was quantized and contained a noise -- a Japanese quince -- an accurate motion in which it is quantized and sufficient effect is accepted also in the controller

106 also to a actual picture having contained a noise -- it becomes removable [a Japanese quince].

[0635]As mentioned above, the separation server 11 which shows drawing 27 composition can be contained in an inputted image, can be moved, and can adjust quantity of a Japanese quince.

[0636]Drawing 110 is a block diagram showing other composition of a function of the separation server 11.

[0637]The same number is given to a portion shown in drawing 27, and same portion, and the explanation is omitted suitably.

[0638]The field specific part 103 supplies area information to the mixture ratio calculation part 104 and the synchronizer 1001.

[0639]The mixture ratio calculation part 104 supplies the mixture ratio alpha to the foreground background separation part 105 and the synchronizer 1001.

[0640]The foreground background separation part 105 supplies a foreground ingredient picture to the synchronizer 1001.

[0641]The synchronizer 1001 outputs image composing which combined arbitrary background images and a foreground ingredient picture supplied from the foreground background separation part 105 based on area information supplied from the mixture ratio alpha supplied from the mixture ratio calculation part 104, and the field specific part 103 and in which arbitrary background images and a foreground ingredient picture were combined.

[0642]Drawing 111 is a figure showing composition of the synchronizer 1001. Based on the mixture ratio alpha and arbitrary background images, the background component generation part 1021 generates a background component image, and supplies it to the mixing zone image synthesis section 1022.

[0643]By combining a background component image and a foreground ingredient picture which were supplied from the background component generation part 1021, the mixing zone image synthesis section 1022 generates mixing zone image composing, and supplies generated mixing zone image composing to the image synthesis section 1023.

[0644]The image synthesis section 1023 compounds a foreground ingredient picture, mixing zone image composing supplied from the mixing zone image synthesis section 1022, and arbitrary background images based on area information, and generates and outputs image composing.

[0645]Thus, the synchronizer 1001 can combine a foreground ingredient picture to arbitrary background images.

[0646]the mixture ratio which is characteristic quantity -- a picture acquired by combining a foreground ingredient picture with arbitrary background images based on alpha changes with a more natural thing as compared with a picture which only compounded a pixel.

[0647]Drawing 112 is a block diagram showing composition of further others of a function of the separation server 11 which adjusts quantity of motion dotage. The separation server 11 shown in Drawing 112 performs calculation of field specification and the mixture ratio alpha in parallel to the separation server 11 shown in drawing 27 performing calculation of field specification and the mixture ratio alpha in order.

[0648]The same number is given to the same portion as a function shown in a block diagram of drawing 27, and the explanation is omitted.

[0649]An inputted image is supplied to the mixture ratio calculation part 1101, the foreground background separation part 1102, the field specific part 103, and the object extraction part 101.

[0650]The presumed mixture ratio when the mixture ratio calculation part 1101 assumes that a pixel belongs to a covered background region based on an inputted image, And the presumed mixture ratio at the time of assuming that a pixel belongs to an uncovered background region, The presumed mixture ratio at the time of assuming that it computes to each of a pixel contained in an inputted image, and a computed pixel belongs to a covered background region, And the presumed mixture ratio at the time of assuming that a pixel belongs to an uncovered background region is supplied to the foreground background separation part 1102.

[0651]Drawing 113 is a block diagram showing an example of composition of the mixture ratio calculation part 1101.

[0652]The presumed mixture ratio treating part 401 shown in Drawing 113 is the same as the presumed mixture ratio treating part 401 shown in drawing 72. The presumed mixture ratio treating part 402 shown in Drawing 113 is the same as the presumed mixture ratio treating part 402 shown in drawing 72

[0653]Based on an inputted image, by the operation corresponding to a model of a covered background region, the presumed mixture ratio treating part 401 computes the presumed mixture ratio for every pixel, and outputs the computed presumed mixture ratio.

[0654]Based on an inputted image, by the operation corresponding to a model of an uncovered background region, the presumed mixture ratio treating part 402 computes the presumed mixture ratio for every pixel, and outputs the computed presumed mixture ratio.

[0655]. The foreground background separation part 1102 was supplied from the mixture ratio calculation part 1101. The presumed mixture ratio at the time of assuming that a pixel belongs to a covered background region, And based on area information supplied from the presumed mixture ratio at the time of assuming that a pixel belongs to an uncovered background region, and the field specific part 103, a foreground ingredient picture is generated from an inputted image, it moves and a generated foreground ingredient picture is supplied to the Japanese quince controller 106 and the selecting part 107.

[0656]Drawing 114 is a block diagram showing an example of composition of the foreground background separation part 1102.

[0657]The same number is given to the same portion as the foreground background separation part 105 shown in drawing 89, and the explanation is omitted.

[0658]The selecting part 1121 based on area information supplied from the field specific part 103, The presumed mixture ratio at the time of assuming that a pixel belongs to a covered background region supplied from the mixture ratio calculation part 1101, And either of the presumed mixture ratio at the time of assuming that a pixel belongs to an uncovered background region is chosen, and the separation part 601 is supplied by making the selected presumed mixture ratio into the mixture ratio alpha.

[0659]Based on the mixture ratio alpha supplied from the selecting part 1121, and area information, the separation part 601 extracts an ingredient of a foreground, and an ingredient of a background from a pixel value of a pixel belonging to a mixing zone, and supplies an ingredient of an extracted foreground to the synchronizer 603, and it supplies an ingredient of a background to the synchronizer 605.

[0660]The separation part 601 can be considered as composition shown in drawing 94, and the same composition.

[0661]The synchronizer 603 combines and outputs a foreground ingredient picture. The synchronizer 605 compounds and outputs a background component image.

[0662]a motion shown in Drawing 112 -- a Japanese quince -- a motion included in a foreground ingredient picture which could consider the controller 106 as the same composition as a case where it is shown in drawing 27, and was supplied from the foreground background separation part 1102 based on area information and a motion vector -- adjusting quantity of a Japanese quince -- a motion -- a foreground ingredient picture to which quantity of a Japanese quince was adjusted is outputted.

[0663]The selecting part 107 shown in Drawing 112, for example based on a selection signal corresponding to a user's selection, Either one of a foreground ingredient picture supplied from the foreground background separation part 1102 and a foreground ingredient picture to which was supplied from the motion dotage controller 106, it moved, and quantity of a Japanese quince was adjusted is chosen, and a selected foreground ingredient picture is outputted.

[0664]Thus, to a picture corresponding to an object of a foreground included in an inputted image, the separation server 11 which shows composition in Drawing 112 can be contained in the picture, can be moved, and can adjust and output quantity of a Japanese quince. the mixture ratio which is the buried information like [the separation server 11 which shows composition in Drawing 112] the 1st example -- the mixture ratio which computed and computed alpha -- alpha can be outputted.

[0665]Drawing 115 is a block diagram showing other composition of a function of the separation server 11 which combines a foreground ingredient picture with arbitrary background images. The separation server 11 shown in Drawing 115 performs calculation of field specification and the mixture ratio alpha parallel to the separation server 11 shown in Drawing 110 performing calculation of field specification and the mixture ratio alpha serially.

[0666]The same number is given to the same portion as a function shown in a block diagram of Drawing 112, and the explanation is omitted.

[0667]The presumed mixture ratio when the mixture ratio calculation part 1101 shown in Drawing 115 assumes that a pixel belongs to a covered background region based on an inputted image, And the presumed mixture ratio at the time of assuming that a pixel belongs to an uncovered background region, The presumed mixture ratio at the time of assuming that it computes to each of a pixel contained in an inputted image, and a computed pixel belongs to a covered background region, And the presumed mixture ratio at the time of assuming that a pixel belongs to an

uncovered background region is supplied to the foreground background separation part 1102 and the synchronizer 1201.

[0668]. The foreground background separation part 1102 shown in Drawing 115 was supplied from the mixture ratio calculation part 1101. The presumed mixture ratio at the time of assuming that a pixel belongs to a covered background region, And based on area information supplied from the presumed mixture ratio at the time of assuming that a pixel belongs to an uncovered background region, and the field specific part 103, a foreground ingredient picture is generated from an inputted image, and a generated foreground ingredient picture is supplied to the synchronizer 1201.

[0669]The presumed mixture ratio at the time of assuming that a pixel belongs to a covered background region to which the synchronizer 1201 was supplied from the mixture ratio calculation part 1101, And background images arbitrary based on area information supplied from the presumed mixture ratio at the time of assuming that a pixel belongs to an uncovered background region, and the field specific part 103, Image composing which combined a foreground ingredient picture supplied from the foreground background separation part 1102 and in which arbitrary background images and a foreground ingredient picture were combined is outputted.

[0670]Drawing 116 is a figure showing composition of the synchronizer 1201. The same number is given to the same portion as a function shown in a block diagram of Drawing 111, and the explanation is omitted.

[0671]The selecting part 1221 based on area information supplied from the field specific part 103, The presumed mixture ratio at the time of assuming that a pixel belongs to a covered background region supplied from the mixture ratio calculation part 1101, And either of the presumed mixture ratio at the time of assuming that a pixel belongs to an uncovered background region is chosen, and the background component generation part 1021 is supplied by making the selected presumed mixture ratio into the mixture ratio alpha.

[0672]Based on the mixture ratio alpha supplied from the selecting part 1221, and arbitrary background images, the background component generation part 1021 shown in Drawing 116 generates a background component image, and supplies it to the mixing zone image synthesis section 1022.

[0673]By combining a background component image and a foreground ingredient picture which were supplied from the background component generation part 1021, the mixing zone image synthesis section 1022 shown in Drawing 116 generates mixing zone image composing, and supplies generated mixing zone image composing to the image synthesis section 1023.

[0674]The image synthesis section 1023 compounds a foreground ingredient picture, mixing zone image composing supplied from the mixing zone image synthesis section 1022, and arbitrary background images based on area information, and generates and outputs image composing.

[0675]Thus, the synchronizer 1201 can combine a foreground ingredient picture to arbitrary background images.

[0676]Although an ingredient of a background included in a pixel value carried out the mixture ratio alpha comparatively and it was explained, it is good also as a rate of an ingredient of a foreground included in a pixel value.

[0677]Although the direction of a motion of an object used as a foreground was explained as the right from the left, of course, it is not limited in the direction.

[0678]Although a case where projection of a between [space-time which has two-dimensional space and time base information for a picture of three-dimensional space and real space which has time base information using a video camera] was performed above was made into an example, When amend distortion generated by that projection when the 1st information on more 1st dimension but not only this example is projected on the 2nd information on the 2nd fewer dimension, extracting significant information or combining a picture with nature more, can be adapted of this invention.

[0679]. The sensors 76a are ****** and a solid state image pickup device at CCD. For example, BBD (Bucket Brigade Device), CID (Charge Injection Device), CPD (Charge Priming Device), Or a CMOS (Complementary Mental Oxide Semiconductor) sensor may be used, and a sensor located in a line with one row may be sufficient not only as a sensor by which a sensing element is arranged at matrix form but a sensing element.

[0680]Each function of the separation server 11 explained as mentioned above can also be realized by carrying out distributed processing to various kinds of servers constituted on the network 1 shown by drawing 1. Namely, the object extraction part 101 and the motion detection part 102 to the

motion detection server 12. The field specific part 103 moves to the field specific server 13, the mixture ratio calculation part 104 moves to the mixture ratio calculation server 14, the foreground background separation processing part 105 moves to the foreground background separation processing server 15, and the Japanese quince controller 106 moves and functions as a thing respectively corresponding to the Japanese quince adjustment server 16. Therefore, block diagrams of the separation server 11 shown by drawing 27 may be any although what is realized by hardware, a thing realized by software, or the network 1 realized. The same may be said of the synthetic server 19, and the composition may be any although what corresponds to the synchronizer 1201 and was realized by hardware, a thing realized by software, or the network 1 realized.

[0681]the above object extraction part 101, the motion detection part 102, the field specific part 103, the mixture ratio calculation part 104, and the foreground background separation processing part 105 -- and, Since each processing of the motion dotage controller 106 is the same as that of the motion detection server 12, the field specific server 13, the mixture ratio calculation server 14, the foreground background separation processing server 15, and a thing that moved and replaced the Japanese quince adjustment server 16 and the same may be said of the processing, the explanation is omitted.

[0682]The separation server 11 as mentioned above Hardware, Or when realizing as software, it is good also as composition included in each of various kinds of servers connected to drawing 1 on the network 1 of a statement, the client computer 27, and the camera terminal device 28 as separation sections. Then, in the following explanation, when the separation server 11 is explained as a single device which has the function to only divide an inputted picture into a foreground ingredient picture and a background component image, it shall also be called the separation sections 11.

[0683]Next, with reference to a flow chart of Drawing 117, processing of separation service of a picture by the separation server 11 in which it was inputted from the client computer 27 via the network 1 of drawing 1 is explained.

[0684]In Step S1001, the client computer 27 outputs information which specifies a picture to the separation server 11. That is, picture ID which is a concrete picture or specifies a picture as information which specifies a picture which a user wants to separate is outputted to the separation server 11.

[0685]In Step S1011, the separation server 11 acquires a specified picture. That is, when information which specifies the picture when a picture has been transmitted from the client computer 27 has been transmitted, a picture corresponding to the picture ID is read and acquired from on the network 1.

[0686]In Step S1012, the accounting part 11a of the separation server 11 performs accounting with the fee collection server 24 via the network 1. In Step S102', the fee collection server 24 performs accounting with the separation server 11 simultaneously.

[0687]Here, above-mentioned accounting is explained with reference to a flow chart of Drawing 118. Although actual accounting is performed by the separation server 11 and the fee collection server 24, since it is outputted also from the client computer 27, also about processing of the client computer 27, it doubles and information required for various kinds of processings is explained here.

[0688]As shown in Drawing 119, in Step S1101 the client computer 27, Rental spending is transmitted to the separation server 11 via the network 1 with ID information and certification information (password etc.) which specify service and identify a user (user who receives offer of separation service of a picture). That is, when transmitting information which specifies a picture by processing of Step S1001 of Drawing 117 in now, processing of this step S1101 will be performed. Rental spending is a fee concerning separation service.

[0689]In Step S1111, as shown in Drawing 119, the accounting part 11a of the separation server 11 receives ID information and certification information, and transmits ID of rental spending and oneself to the fee collection server 24 further.

[0690]In Step S1121, as shown in Drawing 119, the fee collection server 24 is asked to the financial server 25 in which a financial institution of a customer account manages certification information, customer account ID, and rental spending based on ID transmitted from the separation server 11.

[0691]In Step S1131, as shown in Drawing 119, based on customer account ID and certification information, the financial server (for customers) 25 performs authenticating processing, and notifies an authentication result and information on propriety of use to the fee collection server 24.

[0692]In Step S1122, as shown in Drawing 119, the fee collection server 24 transmits an authentication result and information on use propriety to

the separatior server 11. In the following explanation, an authentication result advances explanation under conditions that the use is possible, satisfactorily. There is a problem in an authentication result, and the processing will be ended when information that the use is not accepted is received.

[0693]In Step S1112, as shown in Drawing 119, the separation server 11 does not have a problem in an authentication result, and when it is the conditions that use of a financial institution is possible, it provides service to the client computer 27. In Step S1102, the client computer 27 receives offer of service. Namely, in now, in Step S1112 the separation server 11, A specified picture is divided into a foreground ingredient picture and a background component image, it outputs to the client computer 27, and the client computer 27 receives a foreground ingredient picture and a background component image which were separated in Step S1102.

[0694]In Step S1113, the separation server 11 transmits a notice of use of service to the fee collection server 24. In Step S1123, the fee collection server 24 notifies customer account ID, rental spending, and donor account ID to the financial server (for customers) 25.

[0695]In Step S1132, the financial server (for customers) 25 transfers rental spending to the donor financial server (for donors) 26 from an account of customer account ID.

[0696]Here, it returns to explanation of a flow chart of Drawing 117.

[0697]In Step S1012 and S1021, after accounting is performed between the separation server 11 and the fee collection servers 24, in Step S1013, the separation server 11 performs separation of a picture. Namely, the field specific part 103 of the separation server 11, Processing of field specification in which it explained with a flow chart of drawing 53 the mixture ratio calculation part 104, With reference to a flow chart of drawing 81, processing of explained calculation of the mixture ratio the foreground background separation part 105, Regulated treatment of motion blur quantity the Japanese quince controller 106 explained processing of separation with a foreground and a background of having explained with reference to a flow chart of drawing 96 to be with a flow chart of drawing 44 by moving is performed, respectively, and a specified picture is separated. Since each of regulated treatment of motion blur quantity, processings of field specification, processings of calculation of the mixture ratio, and processings of separation with a foreground and a background is the same as that of ****, the explanation is omitted.

[0698]In Step S1014, the separation server 11 gives ID to a separated foreground ingredient picture and a background component image, and transmits to the client computer 27. In Step S1002, receive a foreground ingredient picture and a background component image which have been transmitted from the separation server 11 and which are separated, and its ID, and it memorizes to its storage parts store 48 (drawing 2), and the client computer 27 is printed out if needed. A foreground ingredient picture and a background component image in which separation of the client computer 27 was carried out by the separation server 11 according to a user's instructions, Separation server 11 self is made to memorize, or it can be made to memorize by making it output to the storage servers 18 via the network 1 (accumulation).

[0699]Although processing at the time of saying a fee concerning separation transferred by the fee collection server 24 to the financial servers 25 and 26 in the above explanation has been explained, For example, whenever it makes the storage parts store 48 (drawing 2) memorize a point which shows that a user paid a donor of separation service a utilization charge beforehand like a prepaid point and receives offer of separation service, as the point is subtracted, it may be made to perform accounting.

[0700]Here, with reference to a flow chart of Drawing 120, accounting at the time of using a prepaid point is explained.

[0701]In Step S1201, the client computer 27 specifies service and transmits ID information and certification information. That is, the client computer 27 performs processing in Step S1101 of Drawing 117, and same processing.

[0702]In Step S1211, the accounting part 11a of the separation server 11 receives ID information and certification information. In Step S1212, the accounting part 11a subtracts and memorizes a point equivalent to rental spending concerning separation from a prepaid point equivalent to the amount of money beforehand paid in by user of the client computer 27 memorized by the storage parts store 48. In Step S1213, the separation server 11 provides service. That is, in now, the separation server 11 performs separation of an inputted picture, and transmits a foreground ingredient picture and a background component image which were separated to the client computer 27.

[0703]In Step S1202, the client computer 27 receives offer of service. That is, in now, the client computer 27 receives a foreground ingredient

picture and a background component image which are transmitted from the separation server 11.

[0704]Although a case where the separation server 11 has memorized a prepaid point above at its storage parts store 48 (drawing 2) has been explained, it becomes processing with the same said of a case where a card with which a prepaid point was recorded, and what is called a prepaid card are used for example. In this case, the client computer 27 reads a prepaid point memorized by prepaid card at Step S1201, It transmits, and the separation server 11 needs to transmit a point which subtracts a point equivalent to a utilization charge from a point received by accounting, and brings a subtraction result to the client computer 27, and needs to overwrite a prepaid card.

[0705]Next, with reference to a flow chart of Drawing 121, a motion vector of a picture specified from the client computer 27 and processing of motion detection service in which position information is searched for are explained.

[0706]In Step S1301, the client computer 27 outputs information which specifies a picture to the motion detection server 12. That is, picture ID which is a concrete picture or specifies a picture as information which specifies a picture a user wants to carry out motion detection processing is outputted to the motion detection server 12.

[0707]In Step S1311, the motion detection server 12 acquires a specified picture. That is, when information which specifies the picture when a picture has been transmitted from the client computer 27 has been transmitted, a picture corresponding to the picture ID is read and acquired from on the network 1.

[0708]In Step S1312 and S1321, the accounting part 12c of the motion detection server 12 and the fee collection server 24 perform accounting. About accounting, in Drawing 118 and Drawing 120, since it is the same processing as a case in separation service, the explanation is omitted.

[0709]In Step S1313, each object is extracted, the motion detection part 12b detects position information and a motion vector from an acquired picture which was specified, and the object extraction part 12a of the motion detection server 12 transmits to the client computer 27.

[0710]In Step S1302, the client computer 27 receives and memorizes position information and a motion vector of an object which have been transmitted from the motion detection server 12.

[0711]Position information and a motion vector from which the client computer 27 was detected by the motion detection server 12 according to a user's instructions, Motion detection server 12 self is made to memorize, or it can be made to memorize by making it output to the storage servers 18 via the network 1 (accumulation).

[0712]Next, with reference to a flow chart of Drawing 122, processing of field specific service in which a field is pinpointed is explained from information which is performed by the field specific server 13 and which specifies a picture inputted from the client computer 27, and an object.

[0713]In Step S1401, the client computer 27 outputs information which specifies a picture and an object to the field specific server 13. That is, information which is a picture concrete as information which specifies a picture a user wants to carry out field specification, or specifies an object with picture ID which specifies a picture is outputted to the field specific server 13.

[0714]In Step S1411, the field specific server 13 acquires a specified picture. That is, when picture ID which specifies the picture when a picture has been transmitted from the client computer 27 has been transmitted, a picture corresponding to the picture ID is read and acquired from on the network 1.

[0715]In Step S1412 and S1421, the accounting part 13a of the field specific server 13 and the fee collection server 24 perform accounting. About accounting, in Drawing 118 and Drawing 120, since it is the same processing as a case in separation service, the explanation is omitted.

[0716]In Step S1413, the field specific server 13 performs processing of field specification based on information which specifies an object. Since processing of field specification is the same as processing explained with reference to a flow chart of drawing 53, the explanation is omitted.

[0717]In Step S1414, the field specific server 13 transmits area information required in processing of Step S1413 to the client computer 27.

[0718]In Step S1402, the client computer 27 receives and memorizes area information transmitted from the field specific server 13.

[0719]Field specific server 13 self is made to memorize the client computer 27, or area information searched for by the field specific server 13 is made to output to the storage servers 18 via the network 1, and it can make it memorize according to a user's instructions (accumulation).

[0720]next, computing the mixture ratio with reference to a flow chart of Drawing 123 from information which is performed by the mixture ratio

calculation server 14 and which specifies a picture inputted from the client computer 27, and an object, and area information -- the mixture ratio -- processing of calculation service is explained.

[0721]In Step S1501, the client computer 27 outputs information which specifies a picture and an object, and area information to the mixture ratio calculation server 14. That is, picture ID which is a picture concrete as information which specifies a picture a user wants to compute the mixture ratio, or specifies a picture, information which specifies an object, and area information are outputted to the mixture ratio calculation server 14.

[0722]In Step S1511, the mixture ratio calculation server 14 acquires a specified picture. That is, when picture ID which specifies the picture when a picture has been transmitted from the client computer 27 has been transmitted, a picture corresponding to the picture ID is read and acquired from on the network 1.

[0723]In Step S1512 and S1521, the accounting part 14a of the mixture ratio calculation server 14 and the fee collection server 24 perform accounting. About accounting, in Drawing 118 and Drawing 120, since it is the same processing as a case in separation service, the explanation is omitted.

[0724]In Step S1513, the mixture ratio calculation server 14 performs processing of calculation of the mixture ratio based on information which specifies an object, and area information. Since processing of calculation of the mixture ratio is the same as processing explained with reference to a flow chart of drawing 81, the explanation is omitted.

[0725]In Step S1514, the mixture ratio calculation server 14 transmits the mixture ratio required in processing of Step S1513 to the client computer 27.

[0726]In Step S1502, the client computer 27 receives and memorizes the mixture ratio transmitted from the mixture ratio calculation server 14.

[0727]Mixture ratio calculation server 14 self is made to memorize the client computer 27, or the mixture ratio called for by the mixture ratio calculation server 14 is made to output to the storage servers 18 via the network 1, and it can make it memorize according to a user's instructions (accumulation).

[0728]. Next, the foreground background separation server 15 performs with reference to a flow chart of Drawing 124. Processing of service separated into a foreground ingredient picture and a background component image from information, area information, and the mixture ratio which specify a picture inputted from the client computer 27 and an object is explained.

[0729]In Step S1601, the client computer 27 outputs information, area information, and information on the mixture ratio that a picture and an object are specified to the foreground background separation server 15. That is, picture ID which is a picture concrete as information which specifies a picture a user wants to carry out foreground background separation, or specifies a picture, information which specifies an object, area information, and information on the mixture ratio are outputted to the foreground background separation server 15.

[0730]In Step S1611, the foreground background separation server 15 acquires a specified picture. That is, when picture ID which specifies the picture when a picture has been transmitted from the client computer 27 has been transmitted, a picture corresponding to the picture ID is read and acquired from on the network 1.

[0731]In Step S1612 and S1621, the accounting part 15a of the foreground background separation server 15 and the fee collection server 24 perform accounting. About accounting, in Drawing 118 and Drawing 120, since it is the same processing as a case in separation service, the explanation is omitted.

[0732]In Step S1613, the foreground background separation server 15 performs processing of separation of a foreground and a background based on information, area information, and the mixture ratio which specify an object. Since processing of separation of a foreground and a background is the same as processing explained with reference to a flow chart of drawing 96, the explanation is omitted.

[0733]In Step S1614, the foreground background separation server 15 gives ID to a foreground ingredient picture and a background component image required in processing of Step S1613, and transmits to the client computer 27.

[0734]In Step S1602, the client computer 27 receives and memorizes a foreground ingredient picture and a background component image which have been transmitted from the foreground background separation server 15.

[0735]A foreground ingredient picture and a background component image in which the client computer 27 has been transmitted by the foreground background separation server 15 according to a user's instructions, Foreground background separation server 15 self is made to memorize, or it can be made to memorize by making it output to the storage servers 18 via the network 1 (accumulation).

[0736]. Next, with reference to a flow chart of Drawing 125, move and the Japanese quince adjustment server 16 performs. Information and a motion vector which specify a picture inputted from the client computer 27, and processing of service in which move, and a specified picture moves and a Japanese quince is adjusted from the amount of Japanese quince adjustments are explained.

[0737]information as which the client computer 27 specifies a picture in Step S1701, a motion vector, and a motion -- a Japanese quince -- it moves and information on the amount of adjustments is outputted to the Japanese quince adjustment server 16. namely, picture ID which is a picture concrete as information which specifies a picture which move, and a user wants to fade and to adjust, or specifies a picture, information which specifies an object, a motion vector, and a motion -- a Japanese quince -- information on the amount of adjustments moves and it is outputted to the Japanese quince adjustment server 16.

[0738]In Step S1711, it moves and the Japanese quince adjustment server 16 acquires a specified picture. That is, when picture ID which specifies the picture when a picture has been transmitted from the client computer 27 has been transmitted, a picture corresponding to the picture ID is read and acquired from on the network 1.

[0739]In Step S1712 and S1721, it moves and the accounting part 16a of the Japanese quince adjustment server 16 and the fee collection server 24 perform accounting. About accounting, in Drawing 118 and Drawing 120, since it is the same processing as a case in separation service, the explanation is omitted.

[0740]in Step S1713 -- a motion -- a Japanese quince -- the adjustment server 16 -- a motion vector and a motion -- a Japanese quince -- being based on information on the amount of adjustments -- a motion -- processing of adjustment of quantity of a Japanese quince is performed. Since processing of adjustment of quantity of motion dotage is the same as processing explained with reference to a flow chart of Drawing 104, the explanation is omitted.

[0741]In Step S1714, it moves, and the Japanese quince adjustment server 16 was called for, moves by processing of Step S1713, gives ID to a Japanese quince adjustment picture, and transmits to the client computer 27.

[0742]In Step S1702, the client computer 27 moves, it has been transmitted from the Japanese quince adjustment server 16, and it moves, and receives and memorizes a Japanese quince adjustment picture.

[0743]The client computer 27 moves, and a Japanese quince adjustment picture is made to output to the storage servers 18, and it can make it to have been transmitted by the Japanese quince adjustment server 16, to move, to make motion dotage adjustment server 16 self memorize, or memorize according to a user's instructions (accumulation).

[0744]Next, detailed composition of the coding server 17 is explained with reference to Drawing 126. A picture as which the separation sections 2002 of the coding server 17 were inputted (picture ID which specifies a picture is inputted and a corresponding picture via the network 1) a picture read from the storage servers 18 -- containing -- it separates into a foreground ingredient picture and a background component image, and outputs to the coding part 2001 with the mixture ratio, a motion vector, and position information. The separation sections 2002 are things like the separation server (separation sections) 11 explained with reference to drawing 27, and since the same may be said of the mixture ratio, a motion vector, and acquisition processing of position information, they omit the explanation.

[0745]The coding part 2001 makes the storage servers 18 output and memorize a foreground ingredient picture and a background component image which are inputted from the separation sections 2002 via the network 1, and. It changes into information, including position information on a network of the storage servers 18 made to memorize, i.e., URL etc., and outputs as foreground ingredient image position data and background component image position information. At this time, the coding part 2001 outputs also about the mixture ratio, a motion vector, and position information which are extracted when separating a foreground ingredient picture and a background component image.

[0746]When a foreground ingredient picture and a background component image are changed into foreground ingredient image position data and

background component image position information by the coding part 2001, respectively, the accounting part 17a (drawing 16, drawing 17) performs accounting to the fee collection server 24 via the network 1. The synthetic server 19 mentioned later is used for this accounting, and a user who receives synthetic service which generates image composing may be made to pay it. When a user using coding service pays beforehand conversely and synthetic service is used, it can be necessary to receive payment of a utilization charge from a user.

[0747]Next, with reference to a flow chart of Drawing 127, processing of coding service which codes a picture inputted from the client computer 27 performed by the coding server 17 is explained. In this explanation, a case where a user of coding service pays a utilization charge is explained.

[0748]In Step S1801, the client computer 27 outputs information which specifies a picture to the coding server 17. That is, information which is a picture concrete as information which specifies a picture which a user wants to code, or specifies picture ID which specifies a picture, and an object is outputted to the coding server 17.

[0749]In Step S1811, the coding server 17 acquires a specified picture. That is, when picture ID which specifies the picture when a picture has been transmitted from the client computer 27 has been transmitted, a picture corresponding to the picture ID is read and acquired from on the network 1.

[0750]In Step S1812 and S1821, the accounting part 17a of the coding server 17 and the fee collection server 24 perform accounting. About accounting, in Drawing 118 and Drawing 120, since it is the same processing as a case in separation service, the explanation is omitted.

[0751]In Step S1813, the separation sections 2002 of the coding server 17 perform picture separation. Since picture separation is the same as processing of Step S1013 of a flow chart of Drawing 117, the explanation is omitted.

[0752]The coding server 17 outputs a foreground ingredient picture and a background component image required in processing of Step S1813 to the storage servers 18, and makes them memorize in Step S1814 (accumulation). In Step S1831, the storage servers 18 memorize a foreground ingredient picture and a background component image which have been transmitted.

[0753]In Step S1815, the coding server 17 adds a motion vector and position information to foreground ingredient image position data and background component position information which were generated by coding, and transmits to the client computer 27.

[0754]In Step S1802, the client computer 27 receives and memorizes foreground ingredient image position data, background component image position information, a motion vector, and position information which have been transmitted from the coding server 17.

[0755]When separating an inputted picture, coding and coding a picture similar to an already coded picture, only data used as the difference is given to numerals (image position data) of an already coded picture, and it may be made for the coding part 2001 to output it. For example, encoded information of the 1st picture that consists of the foreground ingredient picture 1, the foreground ingredient picture 2, and encoded information of the mixture ratio 1 when combining a picture as shown with Drawing 128, When compounding encoded information of the foreground ingredient picture 1, the foreground ingredient picture 3, and the 2nd picture that consists of encoded information of the mixture ratio 2, the foreground ingredient picture 1, Since it is contained in any information on a picture, when compounding, encoded information of the foreground ingredient picture 1 of one picture may be omitted, and only a part from which information on the foreground ingredient picture 1 is deleted can raise a compression ratio rather than a case where it compounds simply as a result.

[0756]When accumulating the 1st picture and 2nd picture as shown in Drawing 128 as a result and the 1st picture is accumulated previously, the 2nd picture should accumulate only the foreground ingredient picture 3 used as difference, and encoded information of the mixture ratio 2. For this reason, when encoded information of the same picture is accumulated over plurality, the more the number of pictures accumulated increases, the more a compression ratio will improve.

[0757]It may be the information which a user specified about the mixture ratio, a motion vector, and position information which are coded by the coding server 17 as shown in Drawing 129. A picture made to code reads a foreground ingredient picture and a background component image corresponding to picture ID specified by user from the storage servers 18, and it may be made to code them, as shown in Drawing 129. In this case, the separation sections 2002 need to be formed in the coding server 17.

[0758]Although picture ID has been used as information which specifies a picture in this specification, it replaces with this and may be made to use

image position data.

[0759]. Next, the synthetic server 19 performs with reference to a flow chart of Drawing 130. Information and a motion vector which specify the pictures A and B inputted from the client computer 27, the mixture ratio, position information, and processing of service which combines the pictures A and B specified from the amount of Japanese quince adjustments by moving are explained.

[0760]information as which the client computer 27 specifies the pictures A and B in Step S1901, a motion vector, the mixture ratio, position information, and a motion -- a Japanese quince -- information on the amount of adjustments is outputted to the synthetic server 19. Namely. [whether it is a concrete picture as information which specifies the pictures A and B which a user wants to combine, and] or picture A-ID and B-ID (coded above-mentioned image position data may be sufficient) which specify the pictures A and B, a motion vector, the mixture ratio, position information, and a motion -- a Japanese quince -- information on the amount of adjustments is outputted to the synthetic server 19.

[0761]In Step S1911, the synthetic server 16 acquires a specified picture. That is, when picture ID (coded above-mentioned image position data may be sufficient) which specifies the picture when a picture has been transmitted from the client computer 27 has been transmitted, a picture corresponding to the picture ID is read and acquired from on the network 1.

[0762]In Step S1912 and S1921, the accounting part 19a of the synthetic server 19 and the fee collection server 24 perform accounting. About accounting, in Drawing 118 and Drawing 120, since it is the same processing as a case in separation service, the explanation is omitted. The above-mentioned coding server 16 is used for this accounting, and when a user who received coding service has paid, it can omit it. On the contrary, a user who received synthetic service may be made to pay instead of a user who received coding service.

[0763]in Step S1913 -- the synthetic server 19 -- a motion vector, the mixture ratio, position information, and a motion -- a Japanese quince -- processing of composition of the pictures A and B is performed based on information on the amount of adjustments.

[0764]In Step S1914, the synthetic server 19 gives ID to image composing (A+B) required in processing of Step S1913, and transmits to the client computer 27.

[0765]In Step S1902, the client computer 27 receives and memorizes image composing (A+B) transmitted from the synthetic server 19.

[0766]Synthetic server 19 self is made to memorize the client computer 27, or image composing (A+B) transmitted by the synthetic server 19 is made to output to the storage servers 18 via the network 1, and it can make it memorize according to a user's instructions (accumulation).

[0767]by the way -- although the synthetic server 20 is made as [be / combining two or more pictures as mentioned above / possible] -- this time -- a motion -- a Japanese quince -- using the amount of adjustments as a key -- a motion of image composing -- a Japanese quince can be added and encrypted images can be generated. Drawing 131 shows composition of the motion dotage adjunct 2021 for codes which makes the synthetic server 20 generate encrypted images and which is provided for accumulating.

[0768]The input process part 2031 of the motion dotage adjunct 2021 for codes, Picture selection information which chooses a picture (background component image) which is going to move information which serves as a cryptographic key at the imaging part 2032 in an inputted encrypted signal which it is going to encipher, and is going to compound the Japanese quince preparing part 2033 and an encrypted signal as a foreground ingredient picture is outputted to the synthetic server 20, respectively.

[0769]When an encrypted signal inputted from the input process part 2031 is not a picture signal, the imaging part 2032 changes the signal into a picture signal moves, and is outputted to the Japanese quince adjunct 2033. That is, since it becomes conditions that it is a picture signal, in order to make a signal by which encryption processing is carried out correspond to the processing, it images a signal which is not a picture signal.

[0770]The motion dotage preparing part 2033 moves based on information of speed and a direction which were inputted from the input process part 2031, generates the amount of Japanese quince adjustments, moves to a picture signal inputted from the imaging part 2032, performs Japanese quince attached processing, and outputs it to the synthetic server 20. The synthetic server 20 acquires a background component image based on picture selection information inputted from the input process part 2031, by making into a foreground ingredient picture a picture which moves and is further inputted from the Japanese quince adjunct 2033, compounds with an acquired background component image, and generates and displays image composing. At this time, the background component image itself may be sufficient as picture selection information which specifies a

background component image, and it may be background component image position information or background component image ID.

[0771]Next, with reference to Drawing 132, image composing enciphered by the motion dotage adjunct 2021 for codes provided in the synthetic server 20 is decoded, and the motion dotage removing part 2041 for codes changed into a signal of a dimension is explained. a motion for codes shown in Drawing 131 and Drawing 132 -- a Japanese quince -- the adjunct 2021 and a motion for codes -- a Japanese quince -- it may carry out and the removing part 2041 may think [which may be considered as a functional block diagram of software built in the client computer 27, for example] that it is a block diagram of hardware. a motion for codes -- a Japanese quince -- the adjunct 2021 and a motion for codes -- a Japanese quince -- it may be made to constitute the removing part 2041 as a dedicated server on the network 1

[0772]The separation server 11 outputs a foreground ingredient picture to which enciphered image composing was divided into a foreground ingredient picture and a background component image, it moved and a Japanese quince was added to the input process part 2051.

[0773]If information on speed and a direction is inputted as a key for decoding a foreground ingredient image which was inputted from the separation server 11 and which is enciphered, and its enciphered foreground ingredient image, the input process part 2051 will move and will be outputted to the Japanese quince removing part 2052. Speed and a direction used as this key are set as each, when two dimensions of a x direction and a y direction show a picture.

[0774]Based on information on speed inputted from the input process part 2051, and a direction, the motion dotage removing part 2052, a foreground ingredient image which generated motion blur quantity and was enciphered -- a motion for codes -- a Japanese quince -- a motion given by the adjunct 2021 -- a Japanese quince -- a motion contrary to attached processing -- a Japanese quince -- attached processing is performed, an enciphered foreground ingredient image is decoded, and it outputs to the signal conversion section 2053. When an encrypted signal is not a picture, the signal conversion section 2053 changes into the original signal a picture signal which moved and was inputted from the Japanese quince removing part 2052, and outputs it.

[0775]namely, the above-mentioned motion -- a Japanese quince -- the preparing part 2033 (Drawing 131) and a motion -- a Japanese quince -- the removing part 2052 -- substantial -- a motion of drawing 97 -- a Japanese quince -- performing the same processing as the adjunct 806, moving as a cryptographic key, and using the amount of Japanese quince adjustments -- a motion reverse to mutual -- attached processing of a Japanese quince is performed. However, points which a x direction mentioned later or a y direction moved, and were previously performed among Japanese quince attached processing of moving and performing processing of a gain rise to Japanese quince attached processing differ.

[0776]By moving here and adding a Japanese quince explains a principle which enciphers a picture signal. For example, as shown in Drawing 133, when a photographic subject moves in the direction of an arrow, If this is picturized by the sensor 76a which consists of CCD etc., before and after the move direction, a picturized picture will move and a mixing zone (a covered background region and an uncovered background region) will produce as a Japanese quince (for details, see drawing 31). According to that speed, it moves, a field of a Japanese quince spreads, and Drawing 134 shows signs that a color picturized is spread further, while a photographic subject is moving it rightward [left-in-the-figure], when picturizing a photographic subject as shown an example which shows this phenomenon and shown with Drawing 134 (A) by the sensor 76a. That is, while a photographic subject is moving to a longitudinal direction by speed v, a picture as shown with Drawing 134 (B) shall be picturized. Supposing it is the field a0 thru/or a0', a field picturized at this time while a photographic subject is standing it still, a field where a photographic subject of Drawing 134 (B) is picturized becomes the field a1 thru/or a1', and the original position a0 thru/or a color of a field of a0' become thin -- a motion -- a color has spread in the fields a1 thru/or a0 used as a Japanese quince and field a0' thru/or a1'. the same -- carrying out -- a photographic subject -- speed -- two -- v (twice of speed v) -- moving -- **** -- if -- a figure -- 134 -- (-- C --) -- being shown -- as -- further -- moving -- a Japanese quince -- becoming -- a field -- a -- two -- or -- a -- zero -- and -- a field -- a -- zero -- ' -- or -- a -- two -- ' -- a color -- spreading -- things -- being shown -- having -- **** . If a photographic subject moves with the speed 3v, as shown in Drawing 134 (D), a motion -- when it spreads in the fields a3 thru/or a0 used as a Japanese quince and field a0' thru/or a3' and moves with the speed 4v, Drawing 134 (E) shows -- as -- a motion -- it spreads in the fields a4 thru/or a0 used as a Japanese quince and field a0' thru/or a4', and a color becomes thin as a whole. Namely, each pixel value outputted from the sensor 76a, Since it is the result of integrating with a certain portion into which an object to picturize

has breadth spatially about shutter time, whenever speed of a pixel value with which it integrates generally of a photographic subject increases only a part not changing, a color will be thinly picturized by spreading spatially. Therefore, decipherment of a photographic subject becomes difficult as a color becomes thin, a field spreads, it moves and a field of a Japanese quince becomes large. Here, a color shows the possibility of decipherment, and it shows that the possibility of decipherment becomes small, so that its possibility of decipherment is so large that it is deep and it is thin.

[0777]a motion -- a Japanese quince -- encryption by adjustment uses this character and cannot take place in the real world -- a motion of the direction of two dimensions -- a Japanese quince is made to encipher by producing a picture That is, as Drawing 135 shows, a picture by which a black dot-like photographic subject was picturized is shown in the leftmost sequence highest rung of a matrix in the state where there is no motion. a motion of the state [state / this] where a motion to a lengthwise direction is for example, -- if a Japanese quince is added, a black dot-like photographic subject will serve as a picture which was moved to a sliding direction and a Japanese quince produced as shown in the middle line highest rung. If it moves to a transverse direction and a Japanese quince is produced, as shown in the middle line middle, it will become the picture which was moved in the direction of four directions of a photographic subject, and a Japanese quince produced.

[0778]It is in this state, and if a motion (speed) of a longitudinal direction is enlarged, it moves further again and a Japanese quince is added, as shown in the middle line bottom, it will become the picture in which it moved to a longitudinal direction and a Japanese quince field spread further. If it moves to a sliding direction and this picture is made to produce a Japanese quince further, as shown in the rightmost sequence bottom, a black dot-like photographic subject will move, a Japanese quince field will spread, and a color will become thin as a whole. Since the possibility of decipherment of a photographic subject falls as a result, it becomes possible to make the picture itself encipher.

[0779]Next, with reference to a flow chart of Drawing 136, encryption processing which the motion dotage adjunct 2021 for codes moved, and used the amount of Japanese quince adjustments is explained. The following explanation explains an example which enciphers a picture by which a photographic subject which consists of 5x5 pixels was picturized, as shown in Drawing 137. Here, in Drawing 137, it supposes that it is shown with the pixel values a thru/or y of each 5x5-pixel pixel, and y shows a lengthwise direction, x shows a transverse direction, and a time axis is explained as the time t.

[0780]In Step S2001, when the input process part 2031 judged whether an encrypted signal was inputted, and the processing is repeated and it is judged with having been inputted until it is inputted, the processing follows it to Step S2002.

[0781]In Step S2002, the input process part 2031 outputs an inputted encrypted signal to the imaging part 2032. In Step S2003, the imaging part 2032 judges whether an inputted encrypted signal is a picture signal. For example, when judged with an encrypted signal not being a picture signal, in Step S2004, the imaging part 2032 changes an encrypted signal into a picture signal, moves, and is outputted to the Japanese quince adjunct 2033. In Step S2003, when judged with encrypted information being a picture signal, the imaging part 2032 moves as it is, and outputs an inputted encrypted signal to the Japanese quince adjunct 2033.

[0782]In Step S2005, if it judges whether information on speed used as a key and a direction was inputted, and the processing is repeated and a key of speed and a direction is inputted until it is inputted, the processing will follow the input signal treating part 2031 to Step S2006.

[0783]In Step S2006, it moves and the Japanese quince adjunct 2033 is enciphered about a x direction to an inputted picture signal (motion dotage is added).

[0784]Here, a generation method of a concrete pixel value when moving a photographic subject and enciphering by Japanese quince adjustment is explained with reference to Drawing 137 thru/or Drawing 149.

[0785]Here, as shown in Drawing 137, how to move the pixels a thru/or e of the bottom to a x direction, make produce a Japanese quince, and encipher is explained. When movement quantity v which shows speed used as a key at this time is set to 5 (it is the virtual number of partitions 5), a pixel of the bottom shown with Drawing 138 is shown like Drawing 139. Namely, since a pixel value of each time direction is divided into five, A relation of a/5=a0=a1=a2=a3=a4, b/5=b0=b1=b2=b3=b4, c/5=c0=c1=c2=c3=c4, d/5=d0=d1=d2=d3=d4, and e/5=e0=e1=e2=e3=e4 will be filled. Here, it is a pixel value of the last time as a pixel in a figure 139 Nakagami stage.

[0786]If a motion (in the case of now the direction of figure Nakamigi) of a x direction is given to a photographic subject, arrangement of a pixel

value will be sl d with a predetermined time interval, and will turn into arrangement as shown with Drawing 140 as a result. Namely, in timing [begin] which moves, the pixel values a0 thru/or e0 are the original positions, and are the following timing, The pixel values a1 thru/or e1 are slid rightward by 1 pixel, and are the following timing further, The pixel values a2 thru/or e2 are slid rightward by 1 more pixel, and are the following timing further, The pixel values a3 thru/or e3 are slid rightward by 1 more pixel, are the following timing further and serve as arrangement which a pixel value moved according to a motion of a photographic subject as it said that the pixel values a4 thru/or e4 were slid rightward by 1 more pixel.

[0787]Each pixel value on a xy plane will be referred to as having added a pixel value shown with Drawing 140 to a time direction. However, for example, wher a leftmost sequence or a rightmost sequence has a possibility of it being set only to the pixel value a0 and e4, and becoming what has a very small value as a pixel value and same processing is carried out also to a y direction after this, a gain rise is processed so that it may not become a very small value. An example which processed this gain rise is shown in Drawing 141.

[0788]Here, a0*=5xa0, b0*=. (5/2) xb0, a0*=. (5/2) xa1, c0*=. (5/3) xc0, b1*=. (5/3) xb1, a2*=. (5/3) xa2, d0*=. (5/4) xd0, c1*=. (5/4) xc1, b2*=. (5/4) xb2, a3*=. (5/4) xa3, e1*=. (5/4) xe1, d2*=(5/4) xd2, c3*=(5/4) xc3, b4*=(5/4) xb4, e2*=(5/3) xe2, d3*=(5/3) xd3, c4*=(5/3) xc4, e3*=(5/2) xe3, and d4*=(5/2) xd4 -- and, It is e4*=5xe4. That is, an aggregate value of each pixel is adjusting a gain so that it may become a pixel value for 1 pixel. As a result, the pixels a thru/or e shown with Drawing 138 will be changed into the pixel ax thru/or dx' as shown with Drawing 142 if movement quantity v is enciphered by x direction on condition of 5 (enciphered), and (if motion dotage addition is carried out) a horizontal pixel number of a photographic subject will increase to 9 from 5. Here a pixel value ax=ax*, bx=(b0*)+ (a1*), cx=(c0*) +(b1*)+ (a2*), dx=(d0*) +(c1*) +(b2*)+ (a3*), They are ex=(e0) +(d1) +(c2) +(b3)+ (a4), ax'=(e1*) +(d2*) +(c3*)+ (b4*), bx'=(e2*) +(d3*)+ (c4*), cx'=(e3*)+ (d4*), and ex=ex*.

[0789]When it enciphers to a x direction to 5x5 pixels [which showed the above processings with Drawing 137] all the y, a pixel value as shown with Drawing 143 will be calculated. namely, -- a pixel -- ax -- or -- yx -- and -- a pixel -- ax -- ' -- or -- dx -- ' -- fx -- ' -- or -- ix -- ' -- kx -- ' -- or -- nx -- ' -- px -- ' -- or -- sx -- ' -- and -- ux -- ' -- or -- xx -- ' -- a pixel -- asking -- having -- a x direction -- moving -- a Japanese quince -- producing -- things -- a x direction -- breadth -- producing -- nine -- a pixel -- every -- asking -- having -- ******** .

[0790]Here, it returns to explanation of a flow chart of Drawing 136.

[0791]In Step S2007, it moves and the Japanese quince adjunct 2033 enciphers a picture signal coded to a x direction to a y direction.

[0792]Here, as shown in Drawing 144, how to move the pixel ax of a rightmost sequence shown with Drawing 143, fx, kx, px, and ux to a y direction, make produce a Japanese quince, and encipher is explained. When movement quantity v which shows speed used as a key at this time is set to 5 (it is the virtual number of partitions 5), a pixel of a rightmost sequence shown with Drawing 143 is shown like Drawing 144. Namely, since a pixel value of each time direction is divided into five, ax/5=ax0=ax1=ax2=ax3=ax4, A relation of fx/5=fx0=fx1=fx2=fx3=fx4, kx/5=kx0=kx1=kx2=kx3=kx4, px/5=px0=px1=px2=px3=px4, and ux/5=ux0=ux1=ux2=ux3=ux4 will be filled. Here, it is a pixel value of the last time as a pixel in a figure 145 Nakagami stage.

[0793]If a motion is given to a y direction to a photographic subject, arrangement of a pixel value will be slid with a predetermined time interval, and will turn into arrangement as shown with Drawing 146 as a result. Namely, in timing [begin] which moves, pixel value ax0, fx0, kx0, px0, and ux0 are the original positions, and they are the following timing, Pixel value ax1, fx1, kx1, px1, and ux1 are slid rightward by 1 pixel, and they are the following timing further, Pixel value ax2, fx2, kx2, px2, and ux2 are slid by 1 more pixel, and they are the following timing further rightward, Pixel value ax3, fx3, kx3, px3, and ux3 are slid by 1 more pixel, and they are the following timing further rightward, Pixel value ax4, fx4, kx4, px4, and ux4 become the arrangement which a pixel value moved according to a motion of a photographic subject as it said that it slid by 1 more pixel rightward.

[0794]Here, it returns to explanation of a flow chart of Drawing 136.

[0795]In Step S2008, the synthetic server 19 compounds a background component image compounded with an enciphered picture (foreground ingredient picture). For example, if a background component image (picture which becomes a x direction from a pixel for one step) which consists of a pixel value of the pixel values B0 thru/or B9 arranged in a y direction as shown with Drawing 147 is compounded, a value to which a pixel value as shown with Drawing 148 was added will turn into a pixel value. That is, a pixel value of a picture by which a pixel value of a picture (motion dotage was added) enciphered in the xy direction is compounded as a pixel value of a foreground ingredient picture is compounded as a pixel value of a

background component image. a result -- ****** -- a figure -- 149 -- being shown -- as -- a pixel value -- A -- F -- K -- P -- U -- Ay -- ' -- Fy -- ' -- Ky -- ' -- Py -- ' -- asking -- having -- ******** -- each -- a pixel value. Pixel value A=ax0+B0x4/5, and pixel value F=fx0+ax0+B1x3/5, and pixel value K=kx0+fx1+ax2+B-2x2/5, and pixel value P=px0+kx1+fx2+ax3+B3x1/5, and pixel value U=ux0+px1+kx2+fx3+ax4, It is set to pixel value Ay'=B5x1/5+ux1+px2+kx3+fx4, pixel value Fy'=B6x2/5+ux2+px3+kx4, pixel value Ky '=B7x3/5+ux3+px4, and pixel value Py' =B8x4/5+ux4.

[0796]By performing these processings to all the y directions, image composing which uses an enciphered foreground ingredient picture as shown with Drawing 150 as a background component image is generated. namely, the inputted 5x5-pixel picture -- 9x9 pixels (the pixels A thru/or Y.) a pixel -- Ax -- or -- Dx -- a pixel -- Fx -- or -- Ix -- a pixel -- Kx -- or -- Nx -- a pixel -- Px -- or -- Sx -- a pixel -- Ux -- or -- Xx -- a pixel -- Ay -- ' -- or -- Ty -- ' -- a pixel -- Ax -- ' -- or -- Dx -- ' -- a pixel -- Fx -- ' -- or -- Ix -- ' -- a pixel -- Kx -- ' -- or -- Nx -- ' -- and -- a pixel -- Px -- ' -- or -- Sx -- ' -- a picture -- changing -- having .

[0797]In addition -- processing of decoding -- a motion for codes -- a Japanese quince -- in the removing part 2041 -- a motion for codes -- a Japanese quince -- a motion completely contrary to processing of the adjunct 2021 -- a Japanese quince -- since attached processing will be performed, the explanation is omitted.

[0798]In processing of the above-mentioned step S2006, when enciphering to a x direction, after performing gain rise processing, encryption of a y direction is performed. Therefore, after decoding to a y direction, since decoding brings down a gain, it is necessary to decode it to a x direction. Since processing of a gain rise is made to a direction enciphered previously, it is necessary to make it correspond to an order that decoding was also enciphered, although an order of encryption processing of a y direction and a x direction may be replaced.

[0799]Next, with reference to a flow chart of Drawing 151, encryption service by the synthetic server 19 equipped with the motion dotage adjunct 2021 for encryption which is Drawing 131 and was shown is explained. This processing is processing in a case of the client computer 27-1 connected on the network 1 transmitting an encrypted signal to the synthetic server 19, and making this encipher and making it transmit to the client computer 27-2. moreover -- the client computer 27 -- a motion for codes -- a Japanese quince -- hardware provided with a separation function of a picture of the separation server 11 which has the removing part 2041 shall be provided, or software shall be installed

[0800]In Step S2101, the client computer 27-1 transmits information (encrypted signal) which it is going to encipher, information on speed used as a cryptographic key, and a direction, and picture selection information (information which chooses a background component image) to the synthetic server 19.

[0801]In Step S2111, synthetic Saba's 19 motion dotage adjunct 2021 for codes enciphers information (encrypted signal) which was inputted from the client computer 27-1 and which it is going to encipher based on a cryptographic key, and performs encryption processing which compounds a selected background component image. About encryption processing, since it explained with reference to a flow chart of Drawing 136, it omits.

[0802]In Step S2112, the synthetic server 19 transmits a picture enciphered and combined to the client computer 27-1 by moving and adding a Japanese quince.

[0803]In Step S2102, the client computer 27-1, When image composing received from the synthetic server 19 is displayed, a user judges whether it is a picture considered as a request and it is judged with it being a desired picture, in Step S2103, it is notified to the synthetic server 19 that it was a desired picture. In Step S2113, the synthetic server 19 judges whether it was a desired picture, for example, since it has received notice that it is a desired picture, in Step S2103 in now, the processing follows it to Step S2114.

[0804]In Step S2114, the accounting part 19a of the synthetic server 19 performs accounting with the fee collection server 24. About accounting, in Drawing 118 and Drawing 120, since it is the same processing as a case in separation service, the explanation is omitted.

[0805]In Step S2115, the synthetic server 19 transmits enciphered image composing to the client computer 27-1. In Step S2104, the client computer 27-1 receives enciphered image composing, and transmits to the client computer 27-2 as it is.

[0806]In Step S2141, the client computer 27-2 receives enciphered image composing. In Step S2142, the client computer 27-2 judges whether a key was inputted or not, and it repeats the processing until a cryptographic key is inputted. In Step S2142, as a cryptographic key, if information on

speed and a direction is inputted, based on speed and a direction which were inputted, it will move, the Japanese quince solvent wiping removal part 2041 will move, and Japanese quince processing will be performed in Step S2143. In Step S2144, a picture from which it moved and a Japanese quince was removed is displayed.

[0807]In Step S2102, when judged with it not being a desired picture, in Step S2015, it notifies the synthetic server 19 that it is not a desired picture, and the processing returns to Step S2101. By this processing, in Step S2114, since it will be judged with it not being a desired picture, processing of the synthetic server 19 returns to processing of Step S2111.

[0808]That is, when a key of speed as which a user of the client computer 27-2 was specified by user of the client computer 27-1, and a direction is correctly inputted by this processing, an image by which an enciphered image was decoded correctly is displayed. Decoding service can also be provided by the same system as above-mentioned encryption service.

[0809]Next, the correction server 20 is explained with reference to Drawing 152.

[0810]The separation sections 11 of the correction server 20 divide an inputted picture (picture which read a picture corresponding from the network 1 top in the case of a picture which picture ID may be sufficient as and was specified by picture ID) into a foreground ingredient picture and a background component image, A foreground ingredient picture is moved and a background component image is outputted to the Japanese quince controller 2101 at a synchronizer. The motion dotage controller 2101 moves by motion (grade of correction is adjusted) blur quantity which had an inputted foreground ingredient picture specified, fades, is adjusted, and is outputted to the synchronizer 2101. The synchronizer 2101 compounds a foreground ingredient picture by which motion dotage adjustment was carried out, and an inputted background component image, and outputs it as a corrected image.

[0811]For example, a picture as shown with Drawing 153 (A) shall be inputted into the correction server 20. That is, as shown in Drawing 153 (A) right part, when a foreground moves a background top to an arrow direction, it moves to a direction of movement and an opposite direction of a foreground, and a Japanese quince arises. As a portion of this motion dotage is a mixing zone and it is shown in Drawing 153 (A) left part, A mixing zone produced in a front portion of the move direction is CB (Covered Background), and a mixing zone produced in a rear part of the move direction is UB (Uncovered Background). With a figure of Drawing 153 (A) left part, since the time-axis t is set as a lengthwise direction, storage states of a pixel value on a pixel and a relation of the passage of time are shown with movement. The separation sections 11 divide this inputted image into a foreground and a background, as shown in Drawing 153 (B). At this time, a mixing zone of an inputted picture is also extracted simultaneously.

[0812]A foreground ingredient picture as shown with Drawing 153 (B) moves, and the motion dotage controller 2101 adjusts a Japanese quince, for example, generates a foreground ingredient picture as shown in Drawing 153 (C). That is, in now, it moves and a Japanese quince is made small (portions of CB and UB are made small). a motion -- a motion for adjusting a Japanese quince -- a Japanese quince -- while a user repeats operation several times, it may be made to input the amount of adjustments -- carrying out -- a motion -- a Japanese quince -- it may be made for the controller 2101 to adjust to a predetermined value

[0813]a motion as the synchronizer 2102 compounded a foreground ingredient picture adjusted as Drawing 153 showed, and an inputted background component image and shown with Drawing 153 (D) -- a Japanese quince -- an adjusted foreground ingredient picture is combined with a background component image, and is outputted.

[0814]A separated background component image is not outputted to the synchronizer 2102 but a background component image to make it changing is inputted into the synchronizer 2102 to change into other different background component images from a thing of a picture into which a background component image was inputted. the correction server 20 -- the separation sections 11 and a motion -- a Japanese quince -- the controller 2101 and the synchronizer 2102 -- the separation server 11 on the network 1, and a motion -- a Japanese quince -- it transposes to the adjustment server 16 and the synthetic server 19, and may be made to constitute

[0815]Next, with reference to a flow chart of Drawing 154, processing of correction service performed by the correction server 20 in which a picture inputted from the client computer 27 is corrected is explained.

[0816]In Step S2201, the client computer 27 outputs information which specifies a picture to the correction server 20. That is, picture ID which is

a concrete picture or specifies a picture as information which specifies a picture which a user wants to correct is outputted to the correction server 20.

[0817]In Step S2211, the correction server 20 acquires a picture and a background component image which were specified and which it is going to correct, and the separation sections 11 divide into a foreground ingredient picture and a background component image a picture which it is going to correct. That is, when picture ID which specifies the picture when a picture has been transmitted from the client computer 27 has been transmitted, a picture corresponding to the picture ID is read and acquired from on the network 1. The separation sections 11 divide an acquired picture into a foreground ingredient picture and a background component image.

[0818]In Step S2212 and S2221, the accounting part 20a of the correction server 20 and the fee collection server 24 perform accounting. About accounting, in Drawing 118 and Drawing 120, since it is the same processing as a case in separation service, the explanation is omitted.

[0819]In Step S2213, the correction server 20 moves, a foreground ingredient picture moves and the Japanese quince controller 2101 performs regulated treatment of a Japanese quince. Since regulated treatment of motion dotage is the same as processing explained with reference to a flow chart of Drawing 104, the explanation is omitted.

[0820]In Step S2214, the synchronizer 2102 compounds a background component image specified as a foreground ingredient picture by which motion dotage adjustment was carried out. In Step S2215, the correction server 20 transmits image composing required in processing of Step S2214, i.e., a corrected image, to the client computer 27.

[0821]In Step S2202, the client computer 27 receives and memorizes a corrected image transmitted from the correction server 20.

[0822]Correction server 20 self is made to memorize the client computer 27, or a picture corrected by the correction server 20 is made to output to the storage servers 18 via a network, and it can make it memorize according to a user's instructions (accumulation).

[0823]Next, with reference to a flow chart of Drawing 155, processing of purchase service of a picture which purchases a picture specified from the client computer 27 performed by the purchase server 21 is explained.

[0824]In Step S2301, the client computer 27 outputs information which specifies a picture which wishes to purchase to the purchase server 21. That is, picture ID which specifies a picture as information which specifies a picture which a user wants to purchase is outputted to the purchase server 21.

[0825]In Step S2311, the purchase server 21 acquires a picture which wishes to purchase. That is, a picture corresponding to picture ID transmitted from the client computer 27 is read and acquired from on the network 1.

[0826]In Step S2312 and S2321, the accounting part 21a of the purchase server 21 and the fee collection server 24 perform accounting. About accounting, in Drawing 118 and Drawing 120, since it is the same processing as a case in separation service, the explanation is omitted.

[0827]In Step S2313, the purchase server 21 transmits a picture acquired by processing of Step S2311 to the client computer 27.

[0828]In Step S2302, the client computer 27 receives and memorizes a picture transmitted from the purchase server 21.

[0829]Purchase server 21 self is made to memorize the client computer 27, or a picture purchased by the purchase server 21 is made to output to the storage servers 18, and it can make it memorize according to a user's instructions (accumulation). What gives a picture can be performed by enabling it to transmit to other client computers 27, for example. Other users become possible [purchasing a foreground ingredient picture separated, respectively, a background component image, compounded image composing, or a corrected corrected image by separation service, synthetic service, or correction service as mentioned above].

[0830]Next, with reference to a flow chart of Drawing 156, processing of sale service of a picture performed by the sale server 22 in which a picture specified from the client computer 27 is sold off is explained.

[0831]In Step S2401, the client computer 27 outputs information which specifies a picture which wishes to sell off to the purchase server 21. That is, a picture which a user wants to sell off is outputted to the sale server 22.

[0832]In Step S2411, the sale server 22 acquires a picture which wishes to sell off. That is, a picture transmitted from the client computer 27 is acquired.

[0833]In Step S2422, the sale server 22 sets up a suitable price to a picture expected of sale. Setting out of a price may be beforehand set up by user, may make it set it up in auction form on the network 1, for example, and further, When it is the picture by which a person was picturized, a method which a person currently picturized sets up by whether you are predetermined celebrities, for example may be used.

[0834]In Step S2413 and S2431, the accounting part 22a of the sale server 22 and the fee collection server 24 perform sale accounting.

[0835]Here, sale accounting is explained with reference to a flow chart of Drawing 157. Although actual sale accounting is performed by the sale server 22 and the fee collection server 24, since it is outputted also from the client computer 27, also about processing of the client computer 27, it doubles and information required for various kinds of processings is explained here.

[0836]In Step S2501, ID information which identifies a user (user who requests sale of a picture) is transmitted to the sale server 22 via the network 1.

[0837]In Step S2511, the sale server 22 transmits the amount of money for sale, and ID which identifies the sale server 22 to the fee collection server 24 based on ID information transmitted from the client computer 27.

[0838]In Step S2521, the fee collection server 24 requests transfer to the financial server 25 of a customer account corresponding to ID information for purchased amount to the financial server 26 with a donor account based on ID which identifies the transmitted sale server 22.

[0839]In Step S2531, the financial server 26 for donors transfers the amount of money equivalent to the amount of money for sale to the financial server 25 for customers by which a customer's account is established from a donor's account.

[0840]Here, it returns to explanation of a flow chart of Drawing 156.

[0841]In Step S2424, the sale server 22 notifies the client computer 27 that sale was completed. In Step S2402, the client computer 27 receives a notice of the completion of sale.

[0842]May memorize a picture sold off by user to sale server 21 self, or it is made to output to the storage servers 18, and the sale server 22 can make it memorize (accumulation). When setting up a price in auction form as mentioned above, it may be made to transmit to a successful tenderer's client computer 27.

[0843]Next, the retrieval server 23 is explained with reference to Drawing 158.

[0844]The retrieval server 23 searches a picture currently picturized on the camera terminal device 1 connected on the network 1 based on a search condition (image request signal) inputted from the client computer 27 etc., and outputs a demand picture. As a search condition, they are time, a season, the weather, an area, a place, or a photographic subject.

[0845]The control section 2161 of the retrieval server 23 controls operation of the whole retrieval server 23. It corresponds to camera ID for every camera terminal device 28 which retrieval server 23 self connected to the network 1 recognizes in the database 2162. The data 2162b of position data (acquired by GPS76b which it had camera terminal device 28) of each camera terminal device 28, a meteorological data, data of a photographic subject currently picturized, etc. is memorized as a database. The contents of this database 2162 are predetermined time intervals, the control section 2161 controls the communications department 2165, acquires them from each camera terminal device 28 via the network 1, and they are updated.

[0846]The storage parts store 2163 memorizes a picture acquired from the camera terminal device 28 on the network 1 from the communications department 2165, or memorizes information required for processing of various kinds of pictures.

[0847]The demand information generating part 2164 arranges a search condition inputted from the client computer 27 on the network 1, etc., and generates conditions which can actually be searched on the database 2162. That is, for example, when a season is inputted as a search condition, a season can be specified by time information calculated by position data and the time operation part 2166 of each camera terminal device 28. Then, the demand information generating part 2164 generates position data of latitude longitude on the earth in which a season serves as "spring" from the time present now, for example, when a search condition of "spring" is inputted. The control section 2161 acquires a picture [/ in "spring"] by controlling the communications department 2165 and reading an image pick of the camera terminal device 28 of camera ID corresponding to this position data from on the network 1.

[0848]The separation sections 2167 acquire a retrieval object's picture included in a read picture by separation. The separation sections 2167 have the same function as the separation sections 11.

[0849]Next, with reference to a flow chart of Drawing 159, processing of a search service which searches a picture based on a search condition inputted from the client computer 27 performed by the retrieval server 23 is explained.

[0850]In Step S2601, the client computer 27 outputs a search condition to the retrieval server 23. In Step S2611, the retrieval server 23 receives a search condition by the communications department 2165.

[0851]In Step S2612 and S2631, the accounting part 23a and the fee collection server 24 of the retrieval server 23 perform accounting. About accounting, in Drawing 118 and Drawing 120, since it is the same processing as a case in separation service, the explanation is omitted. Step S2612 and accounting in processing of S2631 are the accounting about a fee to performing a search.

[0852]In Step S2613, the retrieval server 23 searches a picture corresponding to a search condition, and calls a picture which corresponds a picture corresponding in Step S2614. In Step S2641, the camera terminal device 28 transmits a picture picturized now to the retrieval server 23.

[0853]That is, for example, as shown in Drawing 160, it is assumed that the client computer 27-1 thru/or 27-5, the retrieval server 23 and the camera terminal device 28-1 thru/or 28-5 were connected to the network 1. At this time, the client computer 27-2 is operated by user, and as a search condition, If "human being", a "car", and a "building" are transmitted by processing of Step S2611, the retrieval server 23 will search "human being", a "car", and a photographic subject of a "building" with the database 2162 as a search condition in Step S2613. Namely, in the case of Drawing 160, the retrieval server 23, the car 2172 -- the camera terminal device 28-1 of camera ID=1, and the human being 2183 -- the camera terminal device 28-2 of camera ID=2 -- and, It searches that the building 2211 is picturized with the camera terminal device 28-5 of camera ID=5, and a picture is acquired from each camera terminal device 28 in Step S2614.

[0854]In Step S2515, a called picture is separated or the retrieval server 23 judges whether pictures (object) other than a desired condition are included.

[0855]In the case of Drawing 160, in a picture transmitted from the camera terminal device 28-1. Since clouds 2172 other than a search condition are contained houses 2181 other than a search condition are included in a picture transmitted from the camera terminal device 28-2 and a picture corresponding to a search condition in these pictures will be separated, the processing progresses to Step S2616.

[0856]In Step S2616, the separation sections 2167 perform separation. Since separation is the same as processing of Step S1013 of a flow chart of Drawing 117, the explanation is omitted.

[0857]In Step S2617, a called picture is combined and it transmits to the client computer 27. In Step S2602, the client computer 27 acquires a picture transmitted from the retrieval server 23. In Step S2603, the client computer 27 judges whether a received picture was a desired picture. As shown in Drawing 160, in the case of a picture displayed on display 27a-1, "human being" as a search condition, a "car", and a "building", Since it is contained in a picture as the human being 2182, the car 2172, and the building 2211 and is a desired picture, in Step S2604, it is notified to a retrieval server that it was a desired picture.

[0858]In Step S2618, the retrieval server 23 judges whether a notice transmitted from the client computer 27 was a desired picture. Since it was a desired picture in the case of Drawing 160, the processing progresses to Step S2619.

[0859]In Step S2619 and S2632, the accounting part 23a and the fee collection server 24 of the retrieval server 23 perform accounting. About accounting, in Drawing 118 and Drawing 120, since it is the same processing as a case in separation service, the explanation is omitted. Step S2619 and accounting in processing of S2632 are the accounting about a fee to having transmitted a searched picture. In Step S2515, when it is only a picture of a search condition altogether, processing of Step S2616 will be skipped.

[0860]In Step S2603, in spite of having specified a "house", "clouds", and a "face" as a search condition from the client computer 27-4, Since it will not be a desired picture when only the house 2181 and the clouds 2071 are displayed and the face 2201 is not displayed like a picture displayed on display 27a-4, The processing progresses to Step S2605, it transmits that it is not a desired picture to the retrieval server 23, and the processing is ended.

[0861]Since it is reported at this time that the retrieval server 23 was not a desired picture in Step S2618, that processing is ended.

[0862]In this case, it will not be paid to having transmitted a searched picture although a fee concerning retrieval processing will be paid.

[0863]it becomes possible to make it encipher by according to the above, moving to an image and adding a Japanese quince -- further -- a motion -- removal of a Japanese quince, i.e., a motion added at the time of encryption, -- a motion contrary to a Japanese quince -- it becomes possible to decode an enciphered image by adding a Japanese quince.

[0864]A recording medium which recorded a program which performs signal processing of this invention, . As shown in drawing 2 and 3, apart from a computer, are distributed in order to provide a user with a program. The magnetic disks 61 and 91 (a flexible disk is included) with which a program is recorded, the optical discs 62 and 92 (CD-ROM (Compact Disc-Read Only Memory).) . DVD (Digital Versatile Disc) is included. The magneto-optical discs 63 and 93 (MD (Mini-Disc) (trademark) is included), Or it comprises ROMs 42 and 72 with which it is not only constituted by package media which consist of the semiconductor memory 64 and 94 etc., but a user is provided in the state where it was beforehand included in a computer and on which a program is recorded, a hard disk contained in the storage parts stores 48 and 78, etc.

[0865]In this specification, even if processing serially performed in accordance with an order that a step which describes a program recorded on a recording medium was indicated is not of course necessarily processed serially, it also includes a parallel target or processing performed individually.

[0866]In this specification, a system expresses the whole device constituted by two or more devices.

[0867]

[Effect of the Invention]According to the 1st communication apparatus of this invention, a method, and the program, a user's demand information is inputted, The foreground ingredient picture which consists of a foreground object ingredient which constitutes the foreground object of the image data which consists of a pixel value determined according to the quantity of the light which constitutes the picture with which it integrated in time for every pixel according to demand information, The background component image which consists of a background object component which constitutes the background objects of image data is compounded, and it was made to output the image composing which generated and generated image composing.

[0868]The communications system and method of this invention input a user's demand information with the 1st communication apparatus, The image composing which transmits the inputted demand information to the 2nd communication apparatus, and is transmitted from the 2nd communication apparatus according to demand information is received, The 2nd communication apparatus receives the demand information transmitted from the 1st communication apparatus, The foreground ingredient picture which consists of a foreground object ingredient which constitutes the foreground object of the image data which consists of a pixel value determined according to the quantity of the light which constitutes the picture with which it integrated in time for every pixel according to demand information, The background component image which consists of a background object component which constitutes the background objects of image data was compounded, image composing is generated and the generated image composing was transmitted to the 1st communication apparatus.

[0869]In the 2nd communication apparatus of this invention, the method, and the program, the demand information which inputted and inputted the user's demand information is transmitted to other communication apparatus, and the image composing transmitted from other communication apparatus was received according to demand information.

[0870]In the 3rd communication apparatus of this invention, a method, and a program, Receive the demand information transmitted from other communication apparatus, and according to demand information, The foreground ingredient picture which consists of a foreground object ingredient which constitutes the foreground object of the image data which consists of a pixel value determined according to the quantity of the light which constitutes the picture with which it integrated in time for every pixel, The background component image which consists of a background object component which constitutes the background objects of image data is compounded, and the image composing which generated and generated image composing was transmitted to other communication apparatus.

[0871]Also in any, while becoming possible to encipher by moving to an image as a result and adding a Japanese quince, it becomes possible to decode by moving and removing a Japanese quince.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1]It is a figure showing the composition of the 1 embodiment of the image processing system which applied this invention.

[Drawing 2]It is a figure showing the composition of the separation server of drawing 1.

[Drawing 3]It is a figure showing the composition of the camera terminal device of drawing 1.

[Drawing 4]It is a figure showing the function of the separation server of drawing 1.

[Drawing 5]It is a figure showing the function of the separation server of drawing 1.

[Drawing 6]It is a figure showing the function of the motion detection server of drawing 1.

[Drawing 7]It is a figure showing the function of the motion detection server of drawing 1.

[Drawing 8]It is a figure showing the function of the field specific server of drawing 1.

[Drawing 9]It is a figure showing the function of the field specific server of drawing 1.

[Drawing 10]It is a figure showing the function of the mixture ratio calculation server of drawing 1.

[Drawing 11]It is a figure showing the function of the mixture ratio calculation server of drawing 1.

[Drawing 12]It is a figure showing the function of the foreground background separation processing server of drawing 1.

[Drawing 13]It is a figure showing the function of the foreground background separation processing server of drawing 1.

[Drawing 14]It is a figure showing the function of the motion dotage adjustment server of drawing 1.

[Drawing 15]It is a figure showing the function of the motion dotage adjustment server of drawing 1.

[Drawing 16]It is a figure showing the function of the coding server of drawing 1.

[Drawing 17]It is a figure showing the function of the coding server of drawing 1.

[Drawing 18]It is a figure showing the function of the storage servers of drawing 1.

[Drawing 19]It is a figure showing the function of the storage servers of drawing 1.

[Drawing 20]It is a figure showing the function of the synthetic server of drawing 1.

[Drawing 21]It is a figure showing the function of the synthetic server of drawing 1.

[Drawing 22]It is a figure showing the function of the correction server of drawing 1.

[Drawing 23]It is a figure showing the function of the correction server of drawing 1.

[Drawing 24]It is a figure showing the function of the purchase server of drawing 1.

[Drawing 25]It is a figure showing the function of the sale server of drawing 1.
[Drawing 26]It is a figure showing the function of the retrieval server of drawing 1.
[Drawing 27]It is a block diagram showing a separation server.
[Drawing 28]It is a figure explaining the image pick-up by a sensor.
[Drawing 29]It is a figure explaining arrangement of a pixel.
[Drawing 30]It is a figure explaining operation of a sensing element.
[Drawing 31]It is a figure explaining the picture acquired by picturizing the object corresponding to the foreground currently moved, and the object corresponding to a stationary background.
[Drawing 32]It is a figure explaining a background region, a foreground region, a mixing zone, a covered background region, and an uncovered background region.
[Drawing 33]It is the model figure in the picture which picturized the object corresponding to a stationary foreground, and the object corresponding to a stationary background which developed the pixel value of the pixel adjacently located in a line with one row to the time direction.
[Drawing 34]It is the model figure which developed the pixel value to the time direction and divided the period corresponding to shutter time.
[Drawing 35]It is the model figure which developed the pixel value to the time direction and divided the period corresponding to shutter time.
[Drawing 36]It is the model figure which developed the pixel value to the time direction and divided the period corresponding to shutter time.
[Drawing 37]It is a figure showing the example which extracted the pixel of the foreground region, the background region, and the mixing zone.
[Drawing 38]It is a figure showing correspondence with a pixel and the model which developed the pixel value to the time direction.
[Drawing 39]It is the model figure which developed the pixel value to the time direction and divided the period corresponding to shutter time.
[Drawing 40]It is the model figure which developed the pixel value to the time direction and divided the period corresponding to shutter time.
[Drawing 41]It is the model figure which developed the pixel value to the time direction and divided the period corresponding to shutter time.
[Drawing 42]It is the model figure which developed the pixel value to the time direction and divided the period corresponding to shutter time.
[Drawing 43]It is the model figure which developed the pixel value to the time direction and divided the period corresponding to shutter time.
[Drawing 44]It is a flow chart explaining processing of adjustment of the quantity of motion dotage.
[Drawing 45]It is a block diagram showing an example of the composition of the field specific part 103.
[Drawing 46]It is a figure explaining a picture when the object corresponding to a

foreground is moving.

[Drawing 47]It is the model figure which developed the pixel value to the time direction and divided the period corresponding to shutter time.

[Drawing 48]It is the model figure which developed the pixel value to the time direction and divided the period corresponding to shutter time.

[Drawing 49]It is the model figure which developed the pixel value to the time direction and divided the period corresponding to shutter time.

[Drawing 50]It is a figure explaining the conditions of an area judgment.

[Drawing 51]It is a figure showing the example of the specific result of the field of the field specific part 103.

[Drawing 52]It is a figure showing the example of the specific result of the field of the field specific part 103.

[Drawing 53]It is a flow chart explaining processing of field specification.

[Drawing 54]It is a block diagram showing other examples of the composition of the field specific part 103.

[Drawing 55]It is the model figure which developed the pixel value to the time direction and divided the period corresponding to shutter time.

[Drawing 56]It is a figure showing the example of a background image.

[Drawing 57]It is a block diagram showing the composition of the binary object image extraction part 302.

[Drawing 58]It is a figure explaining calculation of a correlation value.

[Drawing 59]It is a figure explaining calculation of a correlation value.

[Drawing 60]It is a figure showing the example of a binary object image.

[Drawing 61]It is a block diagram showing the composition of the temporal change primary detecting element 303.

[Drawing 62]It is a figure explaining the judgment of the area judgment part 342.

[Drawing 63]It is a figure showing the example of a judgment of the temporal change primary detecting element 303.

[Drawing 64]It is a flow chart explaining processing of the field specification of the area judgment part 103.

[Drawing 65]It is a flow chart explaining the details of processing of an area judgment.

[Drawing 66]It is a block diagram showing the composition of further others of the field specific part 103.

[Drawing 67]It is a block diagram explaining the composition of the robust-ized part 361.

[Drawing 68]It is a figure explaining the motion compensation of the motion compensation section 381.

[Drawing 69]It is a figure explaining the motion compensation of the motion compensation section 381.

[Drawing 70]It is a flow chart explaining processing of field specification.

[Drawing 71]It is a flow chart explaining the details of processing of robust-izing.
[Drawing 72]It is a block diagram showing an example of the composition of the mixture ratio calculation part 104.
[Drawing 73]It is a figure showing the example which is the ideal mixture ratio alpha.
[Drawing 74]It is the model figure which developed the pixel value to the time direction and divided the period corresponding to shutter time.
[Drawing 75]It is the model figure which developed the pixel value to the time direction and divided the period corresponding to shutter time.
[Drawing 76]It is a figure explaining approximation using correlation of the ingredient of a foreground.
[Drawing 77]It is a figure explaining the relation of C, N, and P.
[Drawing 78]It is a block diagram showing the composition of the presumed mixture ratio treating part 401.
[Drawing 79]It is a figure showing the example of the presumed mixture ratio.
[Drawing 80]It is a block diagram showing other composition of the mixture ratio calculation part 104.
[Drawing 81]It is a flow chart explaining processing of calculation of the mixture ratio.
[Drawing 82]It is a flow chart explaining processing of the operation of the presumed mixture ratio.
[Drawing 83]the mixture ratio -- it is a figure explaining the straight line which approximates alpha.
[Drawing 84]the mixture ratio -- it is a figure explaining the flat surface which approximates alpha.
[Drawing 85]the mixture ratio -- it is a figure explaining correspondence of the pixel of two or more frames when computing alpha.
[Drawing 86]It is a block diagram showing other composition of the mixture ratio estimation processing part 401.
[Drawing 87]It is a figure showing the example of the presumed mixture ratio.
[Drawing 88]It is a flow chart explaining processing of mixture ratio presumption by the model corresponding to a covered background region.
[Drawing 89]It is a block diagram showing an example of the composition of the foreground background separation part 105.
[Drawing 90]It is a figure showing an inputted image, a foreground ingredient picture, and a background component image.
[Drawing 91]It is the model figure which developed the pixel value to the time direction and divided the period corresponding to shutter time.
[Drawing 92]It is the model figure which developed the pixel value to the time direction and divided the period corresponding to shutter time.
[Drawing 93]It is the model figure which developed the pixel value to the time direction and divided the period corresponding to shutter time.

[Drawing 94]It is a block diagram showing an example of the composition of the separation part 601.

[Drawing 95]It is a figure showing the example of the separated foreground ingredient picture and a background component image.

[Drawing 96]It is a flow chart explaining processing of separation with a foreground and a background.

[Drawing 97]It is a block diagram showing an example of the composition of the motion dotage controller 106.

[Drawing 98]It is a figure explaining a batch.

[Drawing 99]It is the model figure which developed the pixel value of the foreground ingredient picture to the time direction, and divided the period corresponding to shutter time.

[Drawing 100]It is the model figure which developed the pixel value of the foreground ingredient picture to the time direction, and divided the period corresponding to shutter time.

[Drawing 101]It is the model figure which developed the pixel value of the foreground ingredient picture to the time direction, and divided the period corresponding to shutter time.

[Drawing 102]It is the model figure which developed the pixel value of the foreground ingredient picture to the time direction, and divided the period corresponding to shutter time.

[Drawing 103]It is a figure showing other composition of the motion dotage controller 106.

[Drawing 104]It is a flow chart which is contained in the foreground ingredient picture by the motion dotage controller 106, moves, and explains processing of adjustment of the quantity of a Japanese quince.

[Drawing 105]It is a block diagram showing other examples of the composition of the motion dotage controller 106.

[Drawing 106]It is a figure showing the example of the model which specifies correspondence with a pixel value and that of the ingredient of a foreground.

[Drawing 107]It is a figure explaining calculation of the ingredient of a foreground.

[Drawing 108]It is a figure explaining calculation of the ingredient of a foreground.

[Drawing 109]It is a flow chart explaining processing of removal of motion dotage of a foreground.

[Drawing 110]It is a block diagram showing other composition of the function of a separat on server.

[Drawing 111]It is a figure showing the composition of the synchronizer 1001.

[Drawing 112]It is a block diagram showing the composition of further others of the function of a separation server.

[Drawing 113]It is a block diagram showing the composition of the mixture ratio

calculation part 1101.

[Drawing 114]It is a block diagram showing the composition of the foreground background separation part 1102.

[Drawing 115]It is a block diagram showing the composition of further others of the function of a separation server.

[Drawing 116]It is a figure showing the composition of the synchronizer 1201.

[Drawing 117]It is a flow chart explaining separation service.

[Drawing 118]It is a flow chart explaining accounting.

[Drawing 119]It is a figure explaining accounting.

[Drawing 120]It is a flow chart explaining the example of others of accounting.

[Drawing 121]It is a flow chart explaining motion detection service.

[Drawing 122]It is a flow chart explaining field specific service.

[Drawing 123]It is a flow chart explaining mixture ratio calculation service.

[Drawing 124]It is a flow chart explaining foreground background separation service.

[Drawing 125]It is a flow chart explaining motion dotage adjustment service.

[Drawing 126]It is a figure explaining a coding server.

[Drawing 127]It is a flow chart explaining coding service.

[Drawing 128]It is a figure explaining the compression capability at the time of compression by coding processing.

[Drawing 129]It is a figure explaining the example of others of a coding server.

[Drawing 130]It is a flow chart explaining synthetic service.

[Drawing 131]It is a figure explaining the motion dotage adjunct for codes.

[Drawing 132]It is a figure explaining the motion dotage removing part for codes.

[Drawing 133]It is a figure explaining the processing which adds the motion dotage for codes.

[Drawing 134]It is a figure explaining the processing which adds the motion dotage for codes.

[Drawing 135]It is a figure explaining the processing which adds the motion dotage for codes.

[Drawing 136]It is a flow chart explaining encryption processing.

[Drawing 137]It is a figure explaining the processing which adds the motion dotage for codes.

[Drawing 138]It is a figure explaining the processing which adds the motion dotage for codes.

[Drawing 139]It is a figure explaining the processing which adds the motion dotage for codes.

[Drawing 140]It is a figure explaining the processing which adds the motion dotage for codes.

[Drawing 141]It is a figure explaining the processing which adds the motion dotage for codes.

[Drawing 142]It is a figure explaining the processing which adds the motion dotage for codes.
[Drawing 143]It is a figure explaining the processing which adds the motion dotage for codes.
[Drawing 144]It is a figure explaining the processing which adds the motion dotage for codes.
[Drawing 145]It is a figure explaining the processing which adds the motion dotage for codes.
[Drawing 146]It is a figure explaining the processing which adds the motion dotage for codes.
[Drawing 147]It is a figure explaining the processing which adds the motion dotage for codes.
[Drawing 148]It is a figure explaining the processing which adds the motion dotage for codes.
[Drawing 149]It is a figure explaining the processing which adds the motion dotage for codes.
[Drawing 150]It is a figure explaining the processing which adds the motion dotage for codes.
[Drawing 151]It is a flow chart explaining the service for codes.
[Drawing 152]It is a figure explaining a correction server.
[Drawing 153]It is a figure explaining correction processing.
[Drawing 154]It is a flow chart explaining correction service.
[Drawing 155]It is a flow chart explaining purchase service.
[Drawing 156]It is a flow chart explaining sale service.
[Drawing 157]It is a flow chart explaining sale accounting.
[Drawing 158]It is a figure explaining a retrieval server.
[Drawing 159]It is a flow chart explaining a search service.
[Drawing 160]It is a figure explaining a search service.
[Description of Notations]
11 A separation server and 12 motion-detection server, 13 A field specific server and 14 A mixture ratio calculation server, 15 A foreground background separation server and 16 A motion dotage adjustment server, 17 A coding server and 18 storage servers, 19 A synthetic server and 20 A correction server and 21. A purchase server and 22 A sale server and 23. A retrieval server and 24 A fee collection server, 25, and 26. A financia server and 27 A client computer, 28 A camera terminal device and 41 CPU, 42 ROM, 43RAM, 46 input parts, and 47. An outputting part, 48 storage parts stores, and 49 The communications department and 71. CPU, 72 ROM, and 73 RAM, 76 An input part and 76a A sensor and 76b. GPS and 77 An outputting part and 78 A storage parts store, 79 The communications department, 91 magnetic disks, and 92. An optical disc, 93 magneto-optical discs, and 94. Semiconductor memory and 101 object

extraction parts, 102 A motion detection part, a 103 field specific part, and 104 [A frame memory, 202-1 to 202-4 / A static/dynamic detection portion, 203-1 to 203-3 / Area judgment part.] A mixture ratio calculation part and 105 A foreground background separation part, a 106 motion dotage controller, and 107 A selecting part and 201 A 204 decision-flag storing frame memory, 205 A synchronizer and a 206 decision-flag storing frame memory, 301 A background image generation part, a 302 binary object image extraction part, and 303 [An area judgment part and 361 / A robust-ized part,] A temporal change primary detecting element and 321 Correlation value operation part, a 322 threshold treating part, and 341 A frame memory and 342 381 A motion compensation section and 382 A switch, 383-1, or 383-N Frame memory, 384-1 thru/or a 384-N weighting section, and 385. An integrating part and 401 A presumed mixture ratio treating part and 402. A presumed mixture ratio treating part and 403 A mixture ratio deciding part, 421 frame memories and 422 A frame memory, 423 Mixture ratio operation part and 441 A selecting part and 442. A presumed mixture ratio treating part and 443 A presumed mixture ratio treating part, 444 A selecting part and 501 A delay circuit and 502. It adds and is a lump part and 503. Operation part and 601 A separation part, 602 A switch and 603 A synchronizer and 604. A switch and 605 A synchronizer and 621 A frame memory, 622 A separation block and 623 A frame memory, 631 An uncovered region processing part and 632. A covered region processing part and 633 A synchronizer, 634 synchronizers and 801 A batch deciding part, 802 A modeling part and 803 An equation generation part, It adds 804 and is [A batch deciding part, 902 modeling parts, and 903 / An equation generation part and 904 / Operation part and 905 / An amendment part,] a lump part and 805. Operation part, an 806 motion dotage adjunct, and 807 A selecting part and 821 A selecting part and 901 906 A motion dotage adjunct and 907 A selecting part, 1001 synchronizers, and 1021 A background component generation part and 102. 2 A mixing zone image synthesis section and 1023 An image synthesis section, 1101 A mixture ratio calculation part and 1102 A foreground background separation part, 1121 A selecting part and 1201 A synchronizer and 1221. A selecting part and 2001 A coding part and 2002. Separation sections and 2021 The motion dotage adjunct for codes, and 2031. The input communications department and 2032 An imaging part and 2033. A motion dotage adjunct and 2041 The motion dotage removing part for codes, 2051 The input communications department and 2052 A motion dotage removing part, 2053 A signal conversion section and 2101 [A storage parts store and 2164 / A demand information generating part and 2165 / The communications department and 2166 / Time operation part and 2167 / Separation sections] A motion dotage controller, 2102 synchronizers, and 2161 A control section and 2162 A database and 2163